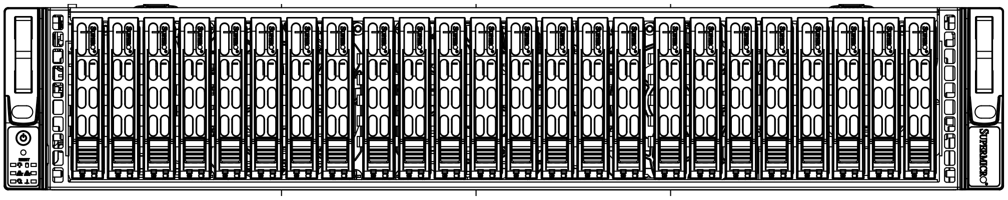
SUPER●®

SC216 CHASSIS
Series



SC216A-R900UB SC216A-R900LPB

SC216E1-R900LPB SC216E2-R900LPB

SC216E1-R900UB SC216E2-R900UB

USER'S MANUAL

1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SC216 2U chassis. Installation and maintenance should be performed by experienced technicians only.

Supermicro's SC216 maximizes storage capacity in a 2U form factor by offering 24 hot-swappable 2.5" SAS/SATA hard drive bays for applications requiring extra storage. The chassis design optimizes every aspect of interior space without compromising superior cooling capabilities. The chassis is equipped with a redundant 900W high-efficiency (85%+) power supply for outstanding power savings, with specially designed optimized cooling.

This document lists compatible parts and configurations available when this document was published. Always refer to the our Web site for updates on supported parts and configurations at www.supermicro.com.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with this chassis and describes the main features of the SC216 chassis. This chapter also includes contact information.

Chapter 2 System Safety

This chapter lists warnings, precautions, and system safety. You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed before installing and servicing this chassis.

Chapter 3: Chassis Components

Refer here for details on this chassis model including the fans, hard drives, airflow shields, and other components.

Chapter 4: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 5: Chassis Setup and Maintenance

This chapter providesdetailed information on this chassis. You should follow the procedures given in this chapter when installing, removing, or reconfiguring your chassis.

Chapter 6: Rack Installation

Refer to this chapter for detailed information on chassis rack installation. You should follow the procedures given in this chapter when installing, removing or reconfiguring your chassis into a rack environment.

Appendices

This section lists compatible cables, power supply specifications, and compatible backplanes. Not all compatible backplanes are listed. Refer to our Web site for the latest compatible backplane information at http://www.supermicro.com

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Appendix A SC216 Chassis Cables

Appendix B SC216 Power Supply Specifications

Appendix C SAS-216A Backplane Specifications

Appendix D SAS-216EL Backplane Specifications

Notes

Chapter 1

Introduction

1-1 Overview

Supermicro's SC216 2U chassis features a unique and highly-optimized design. The chassis is equipped with high efficiency power supply.

1-2 Shipping List

Please visit the following link for the latest shipping lists and part numbers for your particular chassis model http://www.supermicro.com/products/chassis/2U/?chs=216

SC216 Chassis

Model	CPU	HDD	I/O Slots	Power Supply
SC216A-R900UB	Single/Dual CPU	24x 2.5" hot-swap SAS/SATA	4x FH, 3x LP	900W Redundant
SC216A-R900LPB	Single/Dual CPU	24x 2.5" hot-swap SAS/SATA	7x LP	900W Redundant
SC216E1-R900LPB	Single/Dual CPU	24x 2.5" hot-swap SAS/SATA	7x LP	900W Redundant
SC216E2-R900LPB	Single/Dual CPU	24x 2.5" hot-swap SAS/SATA	7x LP	900W Redundant
SC216E1-R900UB	Single/Dual CPU	24x 2.5" hot-swap SAS/SATA	4x FH, 3x LP	900W Redundant
SC216E2-R900UB	Single/Dual CPU	24x 2.5" hot-swap SAS/SATA	4x FH, 3x LP	900W Redundant

1-3 Contacting Supermicro

Headquarters

Address:	Super Micro Computer, Inc.
	980 Rock Ave.
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
Email:	marketing@supermicro.com (General Information)
	support@supermicro.com (Technical Support)
Web Site:	www.supermicro.com

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	4F, No. 232-1, Liancheng Rd.
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Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	886-2-8226-1900

1-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

Whenever possible, repack the chassis in the original Supermicro carton, using the original packaging material. If these are no longer available, be sure to pack the chassis securely, using packaging material to surround the chassis so that it does not shift within the carton and become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Notes

Chapter 2

System Safety

2-1 Overview

This chapter provides a quick setup checklist to get your chassis up and running. Following the steps in order given should enable you to have your chassis setup and operational within a minimal amount of time. This quick set up assumes that you are an experienced technician, familiar with common concepts and terminology.

2-2 Warnings and Precautions

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage, file a damage claim with carrier who delivered your system.

Decide on a suitable location for the rack unit that will hold that chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated.

You will also need it placed near at least one grounded power outlet. When configured, the SC216 chassis includes both a primary and redundant power supply, which requires two grounded outlets.

2-3 Preparing for Setup

The SC216 Chassis includes a set of rail assemblies, including mounting brackets and mounting screws you will need to install the systems into the rack. Please read this manual in its entirety before you begin the installation procedure.

2-4 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SC216 from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the DVD-ROM and floppy drives (not necessary for hot swappable drives). When disconnecting power, you should first power down the system with the operating system and then unplug the power cords from all the power supply modules in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power, if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: CAUTION - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: CAUTION - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

2-5 General Safety Precautions

- Keep the area around the chassis clean and free of clutter.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

2-6 System Safety

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing any board from its antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Chapter 3

Chassis Components

3-1 Overview

This chapter describes the most common components included with your chassis. Some components listed may not be included or compatible with your particular chassis model. For more information, see the installation instructions detailed later in this manual.

3-2 Components

Chassis

The chassis includes three hard drive bays, which support twenty-four 2.5" hard drives. The hard drives must be purchased separately. This chassis accepts a 2U backplane, 3 fans and a redundant power supply. For the latest shipping lists, visit our Web site at: http://www.supermicro.com.

Backplane

Each SC216 chassis comes with a 2U backplane which supports SAS/SATA. For more information regarding compatible backplanes, see the appendices found at the end of this manual. In addition, visit our Web site for the latest information at http://www.supermicro.com.

Fans

The SC216 chassis supports three system fans. System fans for SC216 chassis are powered from the motherboard or the backplane. Fan speed may be controlled if the motherboard has either PWM or DC control ability.

Mounting Rails

The SC216 can be placed in a rack for secure storage and use. To set up your rack, follow the step-by-step instructions included in this manual.

Power Supply

Each SC216 chassis model includes a high-efficiency redundant power supply rated at 900 Watts. In the unlikely event your power supply fails, replacement is simple and can be done without tools.

Air Shroud

Air shrouds are shields, usually plastic, that funnel air directly to where it is needed. Always use the air shroud included with your chassis.

3-3 Where to get Replacement Components

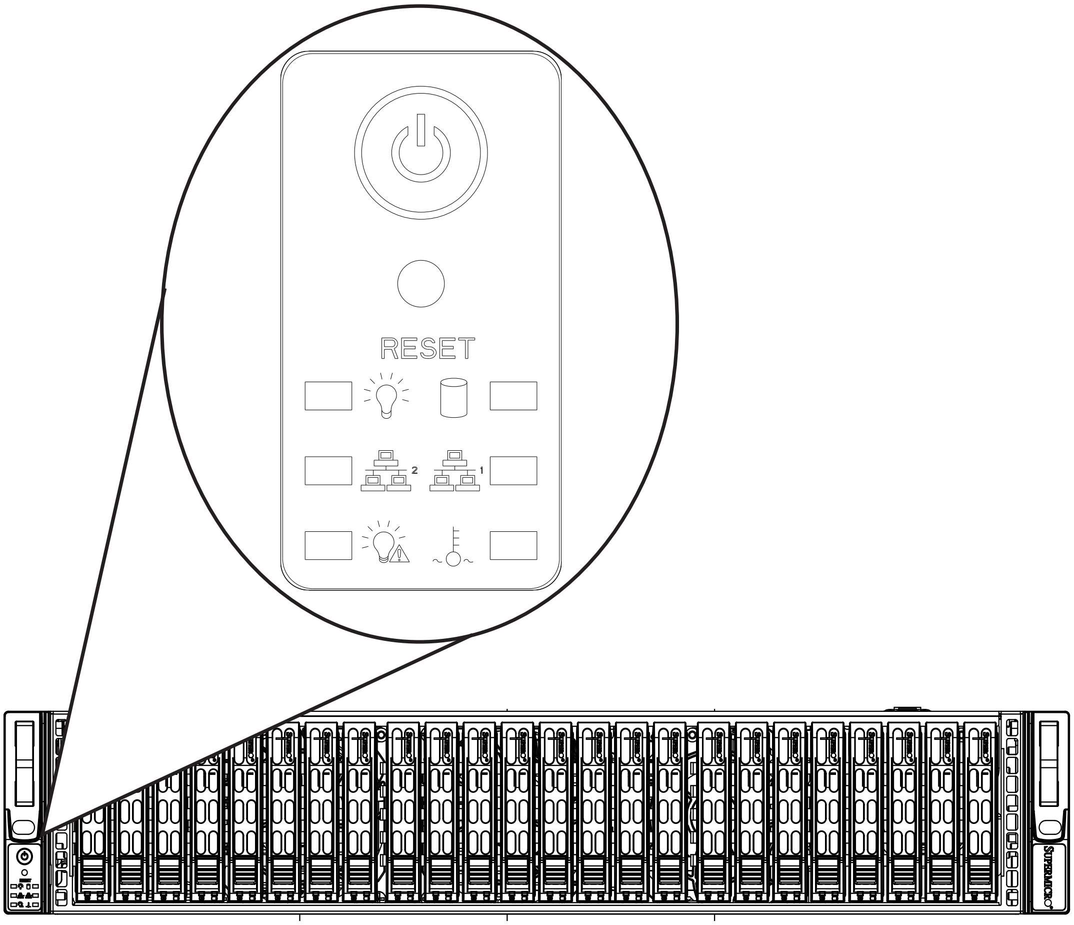
Though not frequently, you may need replacement parts for your system. To ensure the highest level of professional service and technical support, we strongly recommend purchasing exclusively from our Supermicro authorized distributors, system integrators and resellers. A list of Supermicro authorized distributors, system integrators and resellers can be found at: http://www.supermicro.com. Click the Where to Buy link.

Chapter 4

System Interface

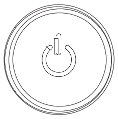
4-1 Overview

The control panel features an LED display, and the individual drive carriers also feature LEDs. These LEDs keep you constantly informed of the overall status of the system, and monitor the activity and health of specific components. SC216 models feature two buttons on the chassis control panel, an on/off button and a reset button. This chapter explains the meanings of all LED indicators and the appropriate responses you may need to take.



4-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are a power on/off button and a reset button.

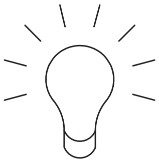


- **Power:** The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.

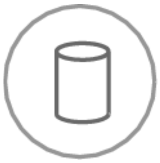
- **Reset:** The reset button is used to reboot the system. A needle, pen, or other small device is required to activate this button and reset the system

4-3 Control Panel LEDs

The control panel located on the front of the SC216 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



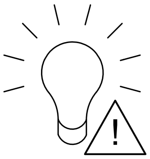
- **Power:** Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.



- **HDD:** Indicates IDE channel activity. SAS/SATA drive and/or DVD-ROM drive activity when flashing.

- **NIC2:** Indicates network activity on GLAN2 when flashing.

- **NIC1:** Indicates network activity on GLAN1 when flashing.



- **Power Failure:** When this LED flashes, it indicates a power failure in the power supply.

- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When continuously on (not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the overheat condition exists.

4-4 Drive Carrier LEDs

The SC216 chassis supports SAS/SATA drives.

SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- **Green or Blue:** Each hard disk drive carrier has either a green or a blue LED, depending upon the hard disk drives and backplane used. When illuminated, this LED indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed. .

- **Red:** The red LED indicates a SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

Chapter 5

Chassis Setup and Maintenance

5-1 Overview

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool required to install components and perform maintenance is a Phillips screwdriver. Print this page to use as a reference while setting up your chassis.

5-2 Installation and Maintenance

Installation:

- Removing the Chassis Cover

- Installing Hard Drives
    - Removing Hard Drive Carriers from the Chassis
    - Installing a Hard Drive to the Hard Drive Carrier

- Installing the Motherboard
    - Stand-offs
    - I/O Shield
    - Add-on and Riser Card Setup

- Installing the Air Shrouds
    - Installing the Main Air Shroud
    - Installing the Additional Air Shroud
    - Checking the Air Flow

General Maintenance:

- Systems Fans
    - Adding a New System Fan
    - Replacing a System Fan
    - Replacing the Power Supply

⚠ Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 2 System Safety and the warning/precautions listed in the setup instructions.

5-3 Removing the Chassis Cover

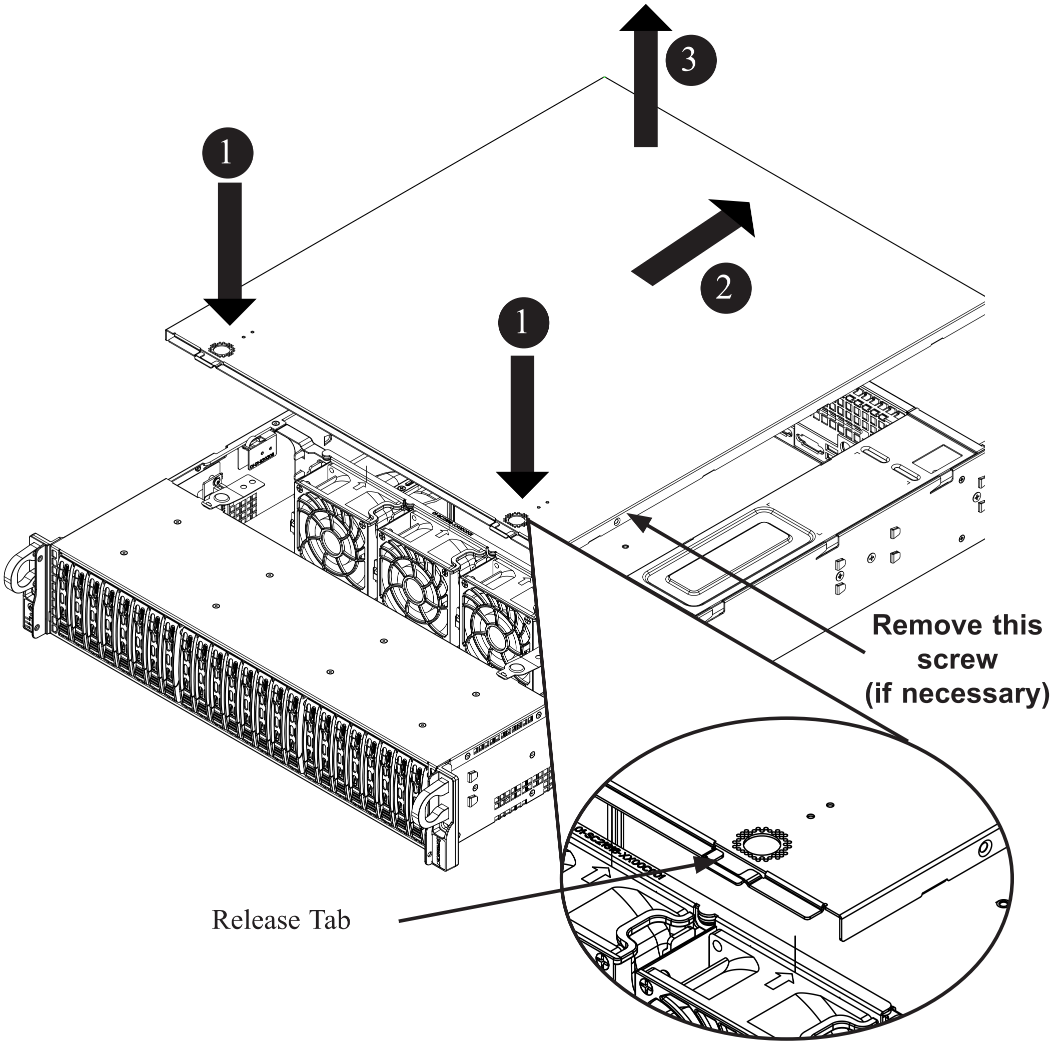


Figure 5-1: Removing the Chassis Cover

Removing the Chassis Cover

1. Press the release tabs to remove the cover from the locked position. Press both tabs at the same time.
2. Once the top cover is released from the locked position, slide the cover toward the rear of the chassis.
3. Lift the cover off the chassis.

Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

5-4 Installing Hard Drives

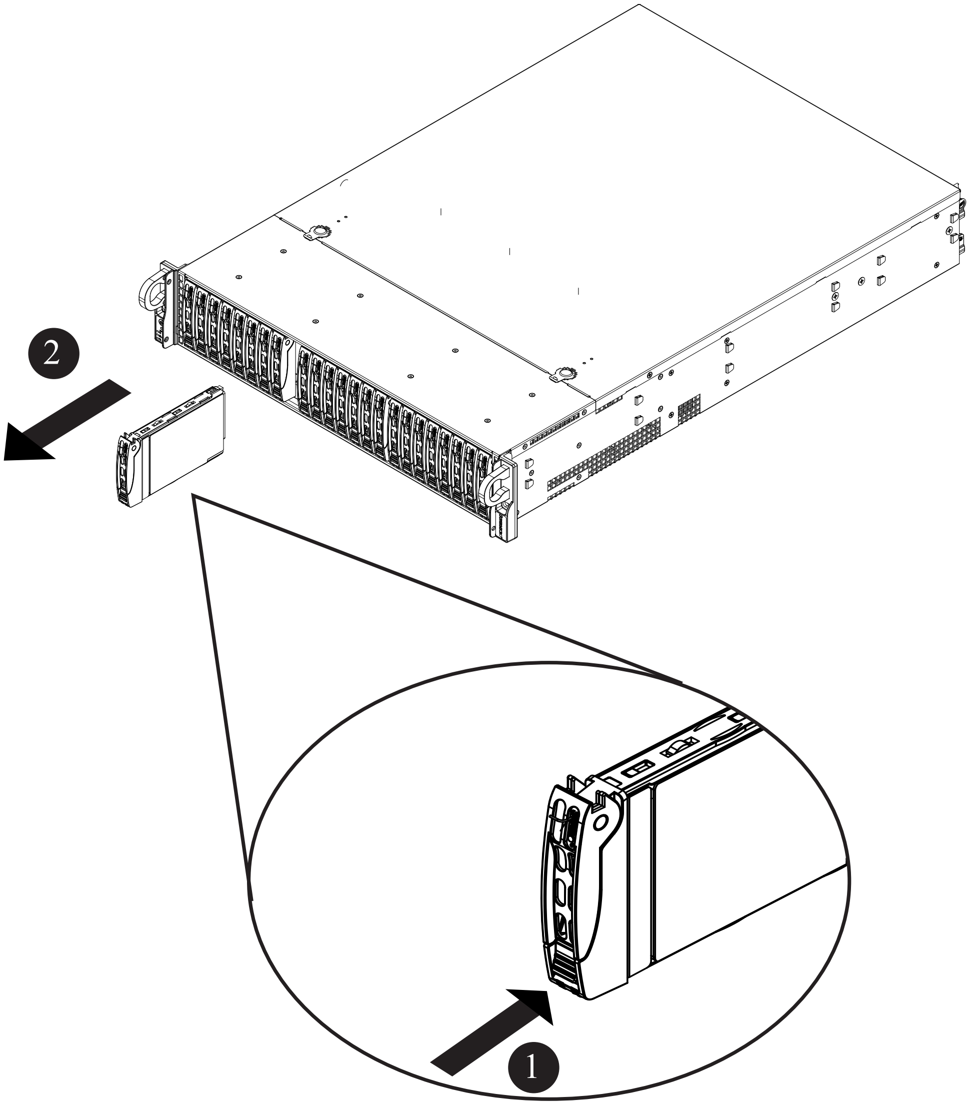


Figure 5-2: Removing Hard Drive

The SC216 comes equipped with twenty-four hot-swappable hard drives. Only SAS or enterprise SATA HDDs are recommended for use in the SC216 chassis.

Removing Hard Drive Trays from the Chassis

1. Press the release button on the drive tray. This extends the drive bay handle.

2. Use the handle to pull the drive out of the chassis.

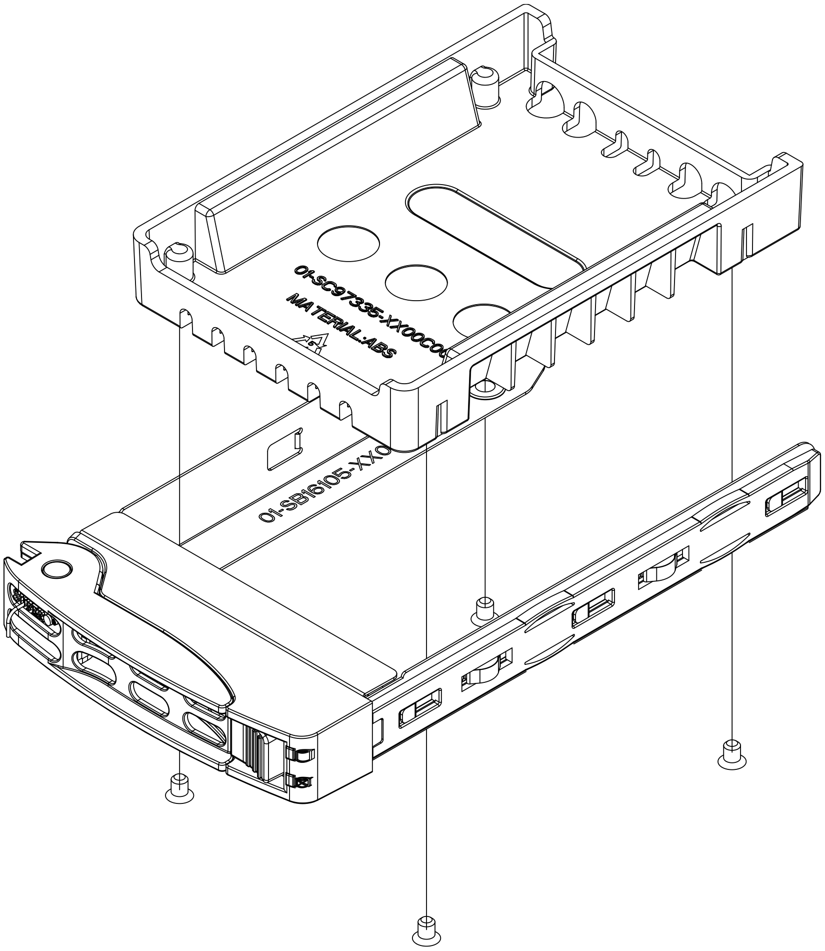


Figure 5-3: Hard Drive Tray

Installing a Hard Drive into a Drive Tray

1. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.

2. Align the drive in the carrier so that the mounting holes of both are aligned. Note that there are holes in the carrier marked "SAS" or “SATA” to aid in correct installation.

3. Secure the drive to the carrier with four screws as illustrated above. Use the four M3 flat-head screws included in the HDD bag of your accessory box. Note that the screws used to secure the dummy drive to the tray cannot be used to secure the hard drive.

4. Insert the hard drive and drive carrier into its bay vertically, keeping the carrier oriented so that the release button is on the bottom. When the carrier reaches the rear of the bay, the release handle will retract.

5. Push the handle in until it clicks into its locked position

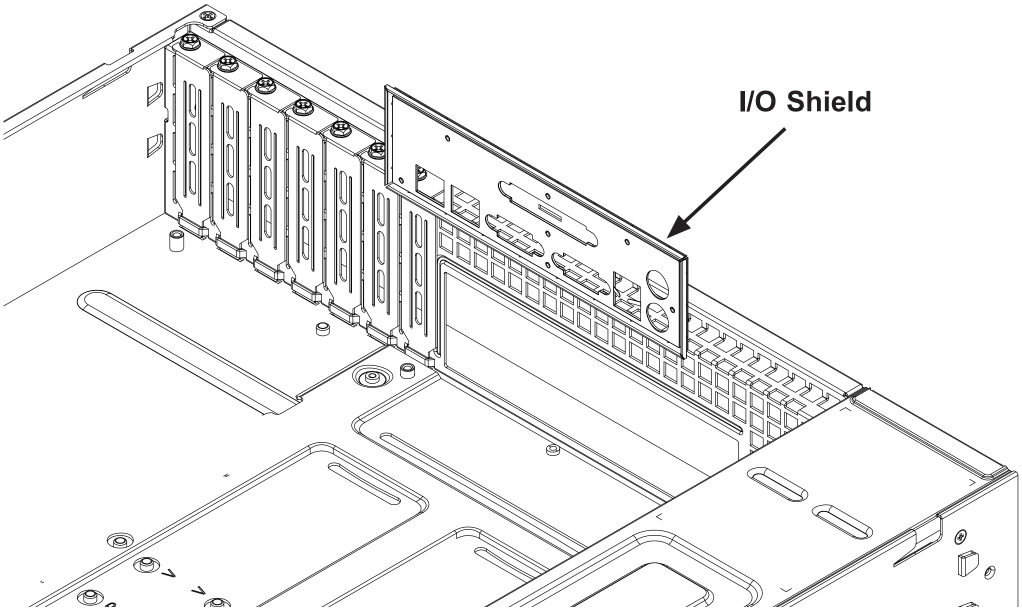


Figure 5-5: I/O Shield Placement

5-5 Installing the Motherboard

I/O Shield

The I/O shield holds the motherboard ports in place. Install the I/O shield before installing the motherboard. If the motherboard you purchased did not include a standard I/O shield, contact the motherboard vendor for a compatible shield.

Installing the I/O Shield

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.

2. Open the chassis cover.

3. With the illustrations facing the outside of the chassis, place the shield into the space provided at the rear of the chassis as illustrated above.

Permanent and Optional Standoffs

Standoffs prevent short circuits by securing space between the motherboard and the chassis surface. The SC216 chassis includes permanent standoffs in locations used by most motherboards. These standoffs accept the rounded Phillips head screws included in the SC216 accessories packaging.

Some motherboard require additional screws for heatsinks, general components and/or non-standard security. Optional standoffs are included for these motherboards. To use an optional standoff, place the hexagonal nut with the rounded side up, in the holes provided on the floor of the chassis.

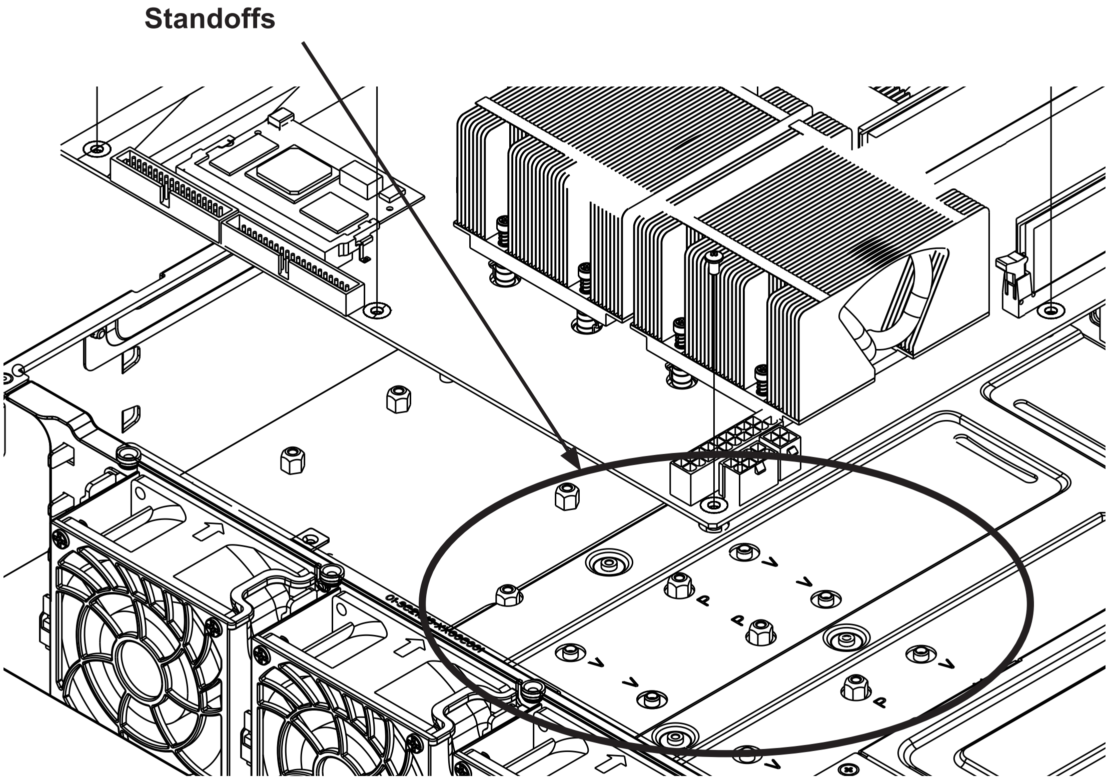


Figure 5-4: Chassis Standoffs and Motherboard Installation

Motherboard Installation

Installing the Motherboard

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, precautions, and cable connections.

2. Open the chassis cover.

3. If necessary, remove the air shroud and riser card bracket.

4. Ensure that the I/O shield has been installed correctly.

5. As required by your motherboard, install standoffs in any areas that do not have a permanent standoff and remove any standoffs that are not required by the motherboard.

6. Lay the motherboard on the chassis aligning the permanent and optional standoffs

7. Secure the motherboard to the chassis using the rounded, Phillips head screws which are included in the motherboard bag of the accessory box.

8. Secure the CPU(s), heatsinks, and other components to the motherboard as described in the motherboard documentation.

9. Connect the cables between the motherboard, backplane, chassis, front panel, and power supply, as needed. Additionally, the fans may be temporarily removed to allow access to the backplane ports and to allow for ease of installation.

5-6 Installing the Add-on Cards

Add-on card installation in the SC216 chassis differs between the UIO and low-profile chassis models. See below for directions that are specific you your chassis type.

Installing Add-on Cards in Low-Profile Model Chassis

Installing Add-on Cards - Low-Profile Chassis Models

1. Remove the chassis cover and ensure that the motherboard has been properly installed.

2. Locate the vertical add-on card slots in the rear of the SC216 chassis.

3. Remove the blank bracket which is pre-installed in the chassis.

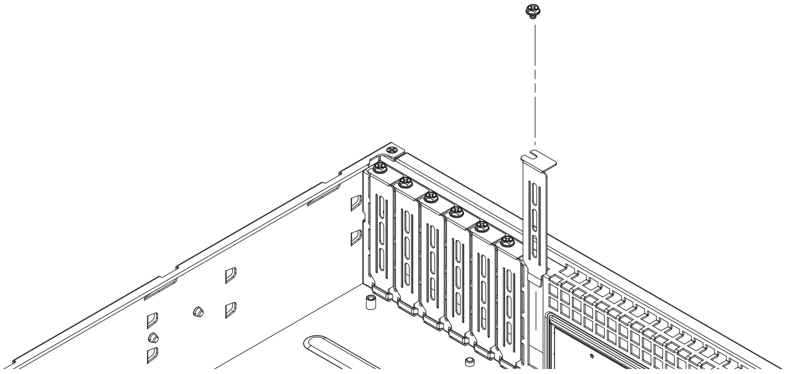


Figure 5-6: Removing the Blank Add-on Card Bracket

4. Simultaneously slide the add-on card carefully into the bracket and plug it into the slot on the motherboard.

5. Screw the add-on card bracket onto the chassis.

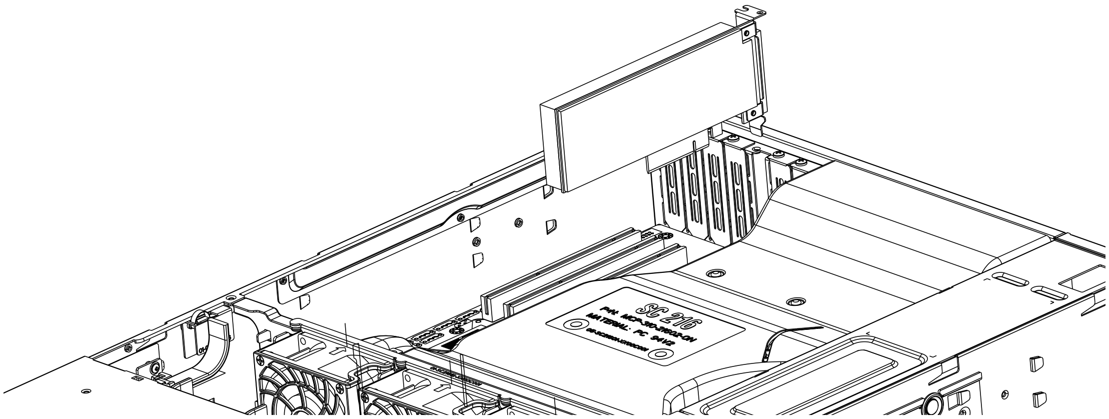


Figure 5-7: Installing the Low Profile Add-on Card

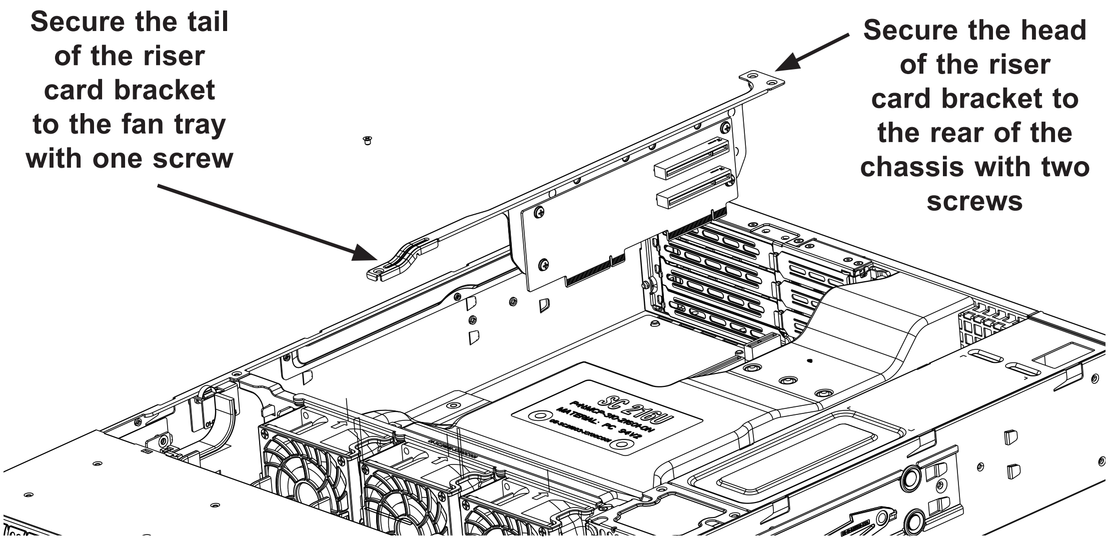

Secure the tail of the riser card bracket to the fan tray with one screw
Secure the head of the riser card bracket to the rear of the chassis with two screws

Figure 5-8: Installing the UIO Riser Card Bracket

Installing Riser Cards and Add-on Cards in UIO Models

Installing the Riser Card - UIO Chassis Models

1. Remove the chassis cover.
2. Remove the riser bracket.
3. Install the riser card onto the riser bracket. Note that there are different cards for the right and left side of the bracket.
4. Gently slide the riser card bracket with the riser card installed into the chassis and simultaneously plug the riser card into the slot on the motherboard.
5. Locate the three screws on your riser card bracket and secure it to the chassis as illustrated above.

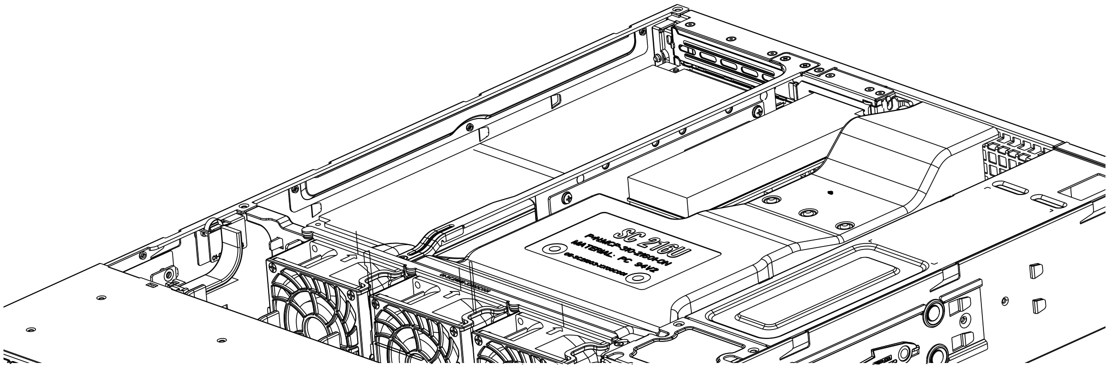


Figure 5-9: UIO Add-on Card Installed

Installing the Add-on Cards in UIO Chassis Models

1. Ensure that the riser card and riser card bracket have been correctly installed in the chassis.

2. Remove the blank bracket from the rear slot in the chassis.

3. Slide the add-on card horizontally into the slot on the riser card.

4. Secure the add-on-card with its clip into the rear slot of the chassis.

5-7 Installing the Air Shrouds

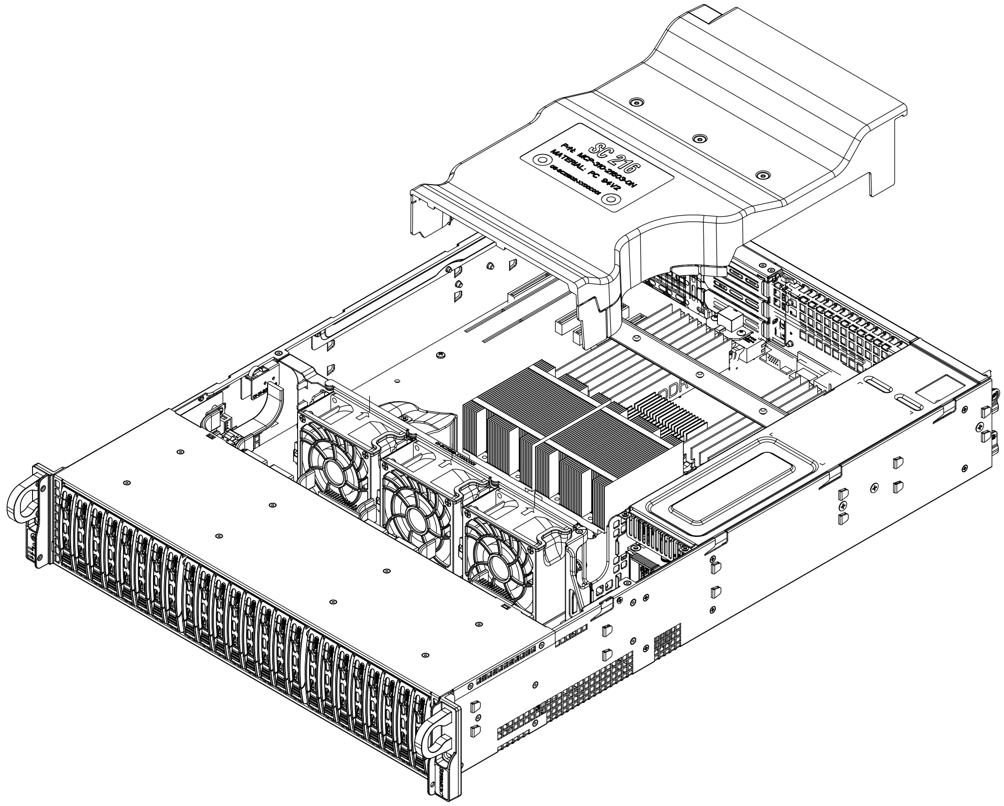


Figure 5-10: Installing the Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency. The SC216 chassis air shroud does not require screws for installation.

Installing the Air Shroud in the Chassis

Installing the Air Shroud

1. Lay the chassis on a flat, stable surface and remove the chassis cover.

2. Ensure that the motherboard, CPU, heatsink and memory are all properly installed.

3. If necessary, move any cables that interfere with the air shroud placement.

4. Place the air shroud in the chassis. The air shroud fits just behind the three fans in the fan rack. Slide the air shroud into the grooves just behind the fan rack.
   Note that some motherboards may require the air shroud to be modified to fit over the motherboard. The SC216 chassis air shroud is designed with break-away pieces that may be removed to accomodate differing styles of motherboards.

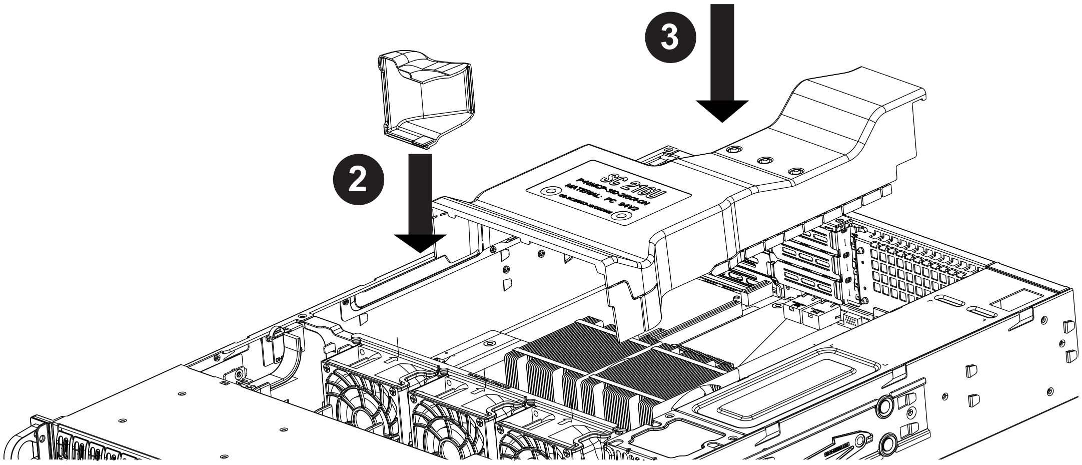


Figure 5-11: Installing the Additional Air Shroud

An additional air shroud is required for high-powered CPUs, to provide extra cooling. Install the additional air shroud if necessary.

Installing the Additional Air Shroud

Installing the Additional Air Shroud in the Chassis

1. Remove the left side break-away piece of the main air shroud.
2. Slide the additional air shroud into the chassis before installing the main air shroud.
3. Install the main air shroud as directed on the previous page.

5-8 Checking the Air Flow

Checking the Server's Air Flow

1. Make sure there are no objects to obstruct airflow in and out of the server. In addition, if you are using a front bezel, make sure the bezel's filter is replaced periodically.

2. Do not operate the server without drives or drive trays in the drive bays. Use only recommended server parts.

3. Make sure no wires or foreign objects obstruct air flow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

The control panel LEDs inform you of system status. See “Chapter 4 System Interface” for details on the LEDs and the control panel buttons.

5-9 System Fans

Three heavy duty fans provide cooling for the chassis. These fans circulate air through the chassis as a means of lowering the chassis internal temperature. The SC216 fans are hot-swappable, enabling the fans to be replaced without powering -down the system.

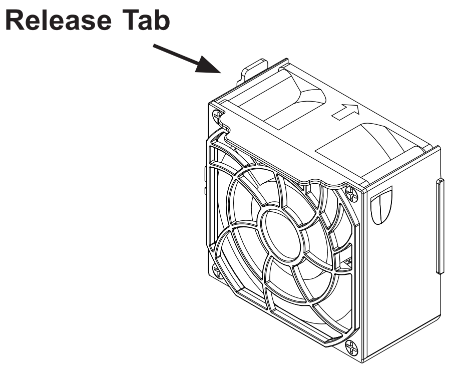


Figure 5-12: System Fan

Replacing a System Fan

1. If necessary, open the chassis while the power is running to determine which fan requires changing. (Never run the server for an extended period of time with the chassis open.)

2. Press the fan release tab to lift the failed fan from the chassis and pull it completely out of the chassis.

3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

4. The fan will automatically begin running at the correct speed.

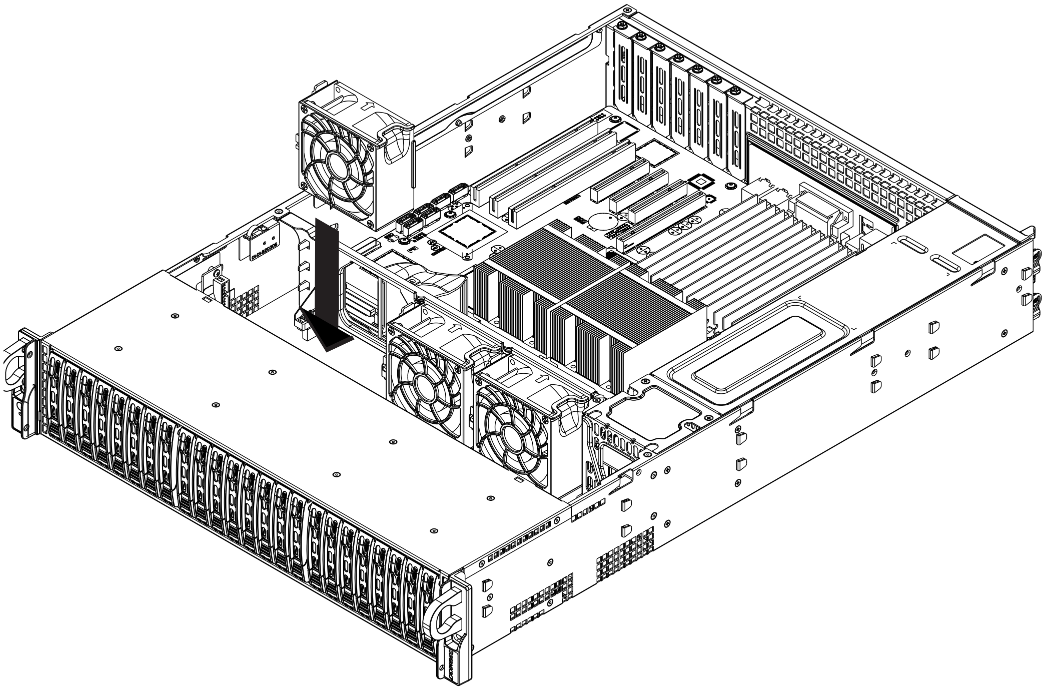


Figure 5-13: Placing the System Fan

5-10 Power Supply

The SC216 chassis has two redundant 900 Watt power supplies. The power modules are hot-swappable, enabling the power supplies to be changed without powering down the system. These power supplies are auto-switching capable. This enables the power supply to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

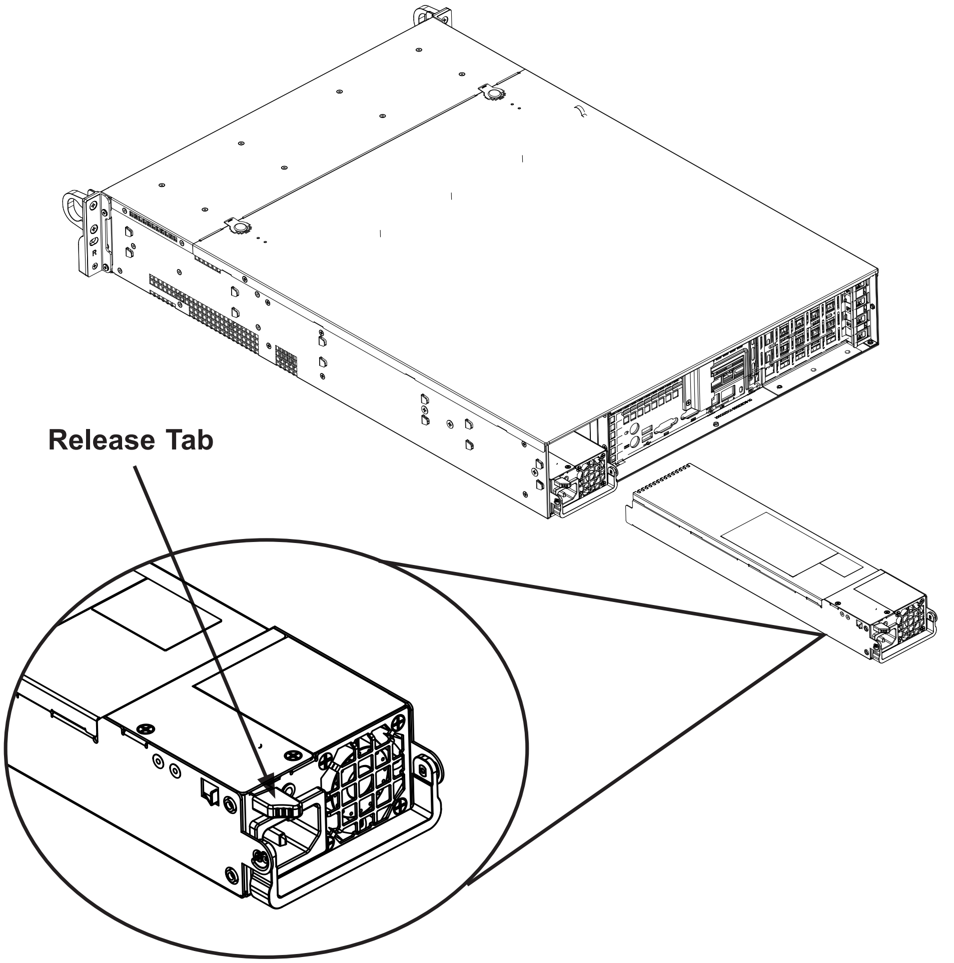


Figure 5-14: Removing the Power Supply

Changing the Power Supply

1. Determine which power supply needs to be replaced and unplug the power cord to that module.

2. Push the release tab (on the back of the power supply) as illustrated, to release the power module from the chassis.

3. While holding down the release tab, pull the power supply out using the handle provided on the power module.

4. Replace the failed power module with the same model power supply.

5. Push the new power supply module into the power bay until the tab clicks into the locked position.

6. Plug the AC power cord back into the module and the replacment power module will automatically power-up.

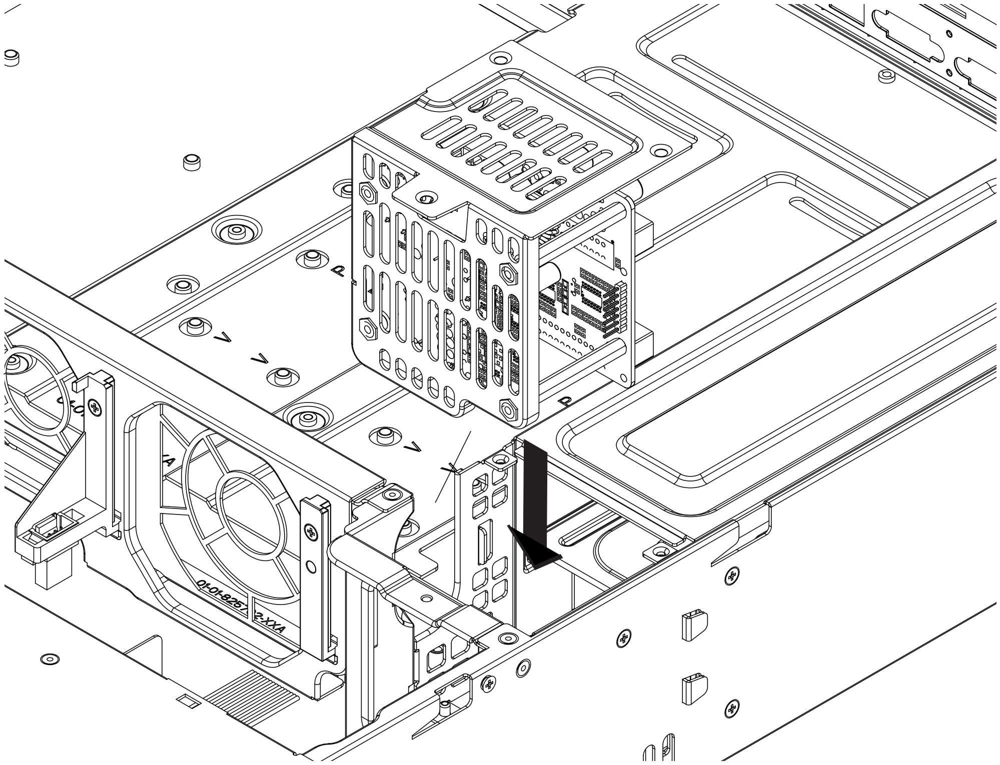


Figure 5-15: Replacing the Power Distributor

Power Distributor

The power distributor provides failover and power supply redundancy, and is pre-installed in the chassis. In the rare event that you have to replace the power distributor, follow the steps below.

Changing the Power Distributor

1. Power down the server and unplug the power cord from the power module.
2. Remove all cable connections to the power supply from the motherboard, backplane, and other components. Also, remove both power supply modules.
3. Remove the screws securing the power distributor.
4. Gently pull the power distributor from the chassis. Gently guide all the cables through the power distributor housing.
5. Slide the new power distributor module into the power distributor housing. Make that you slide the cables through the bottom of the housing.
6. Reconnect all the power cables, replace the power supply, and insert the plug into the wall.

5-11 Removing the Backplane

The SC216 chassis backplane is located behind the hard drives and in front of the front system fans. In order to change jumper settings on the backplane, it may be necessary to remove the backplane from the chassis.

Removing the Backplane from the Chassis

1. Power down and unplug the system from any power source.
2. Remove the chassis cover.
3. Disconnect the cabling to the backplane.
4. Remove all of the hard drive trays from the front of the chassis.
5. Remove the four upper screws at the top of the backplane, indicated by the arrows below.

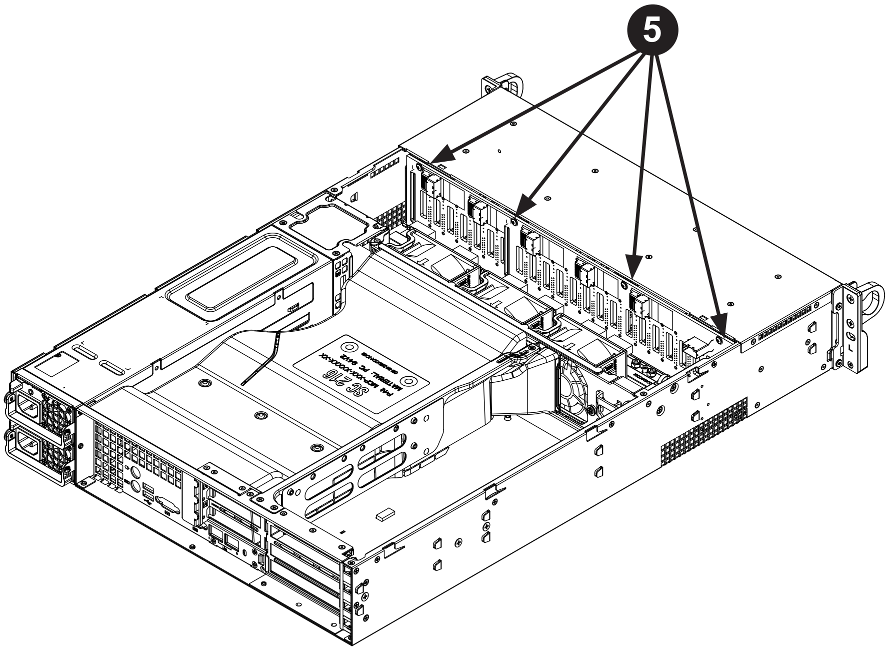


Figure 5-16: Removing the Screws at the Top of the Backplane

6. Loosen the three screws in the spring bar, located on the floor of the chassis, indicated by the arrows below.

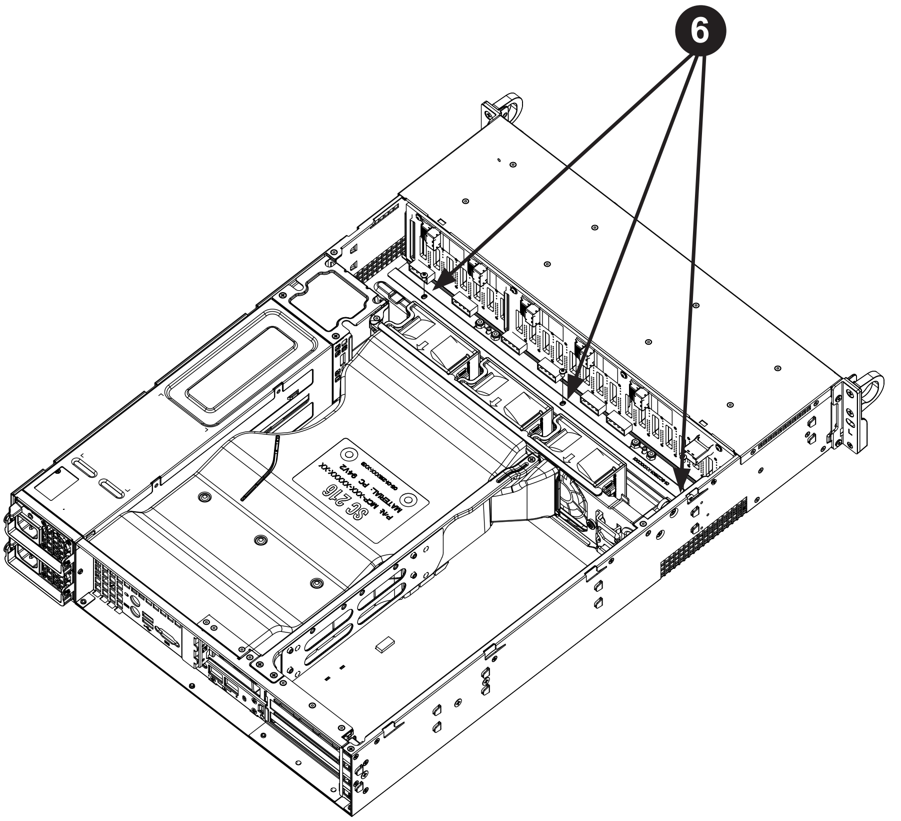

6
SC216
P/N: MCP-XXX-XXXXX-XX
MATERIAL: PC 94V2

Figure 5-17: Loosening the Spring Bar Screws in the Floor of the Chassis

7. Gently ease the backplane up and out of the chassis.

5-12 Installing the Backplane

Installing the Backplane into the Chassis

1. Ensure that all of the hard drive trays have been removed from the bays in the front of the chassis and that the spring bar has been loosened as directed in the previous section.

2. Slide the backplane into the chassis at a slight angle, pushing it up against the side of the chassis.

3. Ease the backplane forward, against the front of the chassis. This will aid in the alignment of the mounting holes.

4. Align the mounting holes in the backplane with the holes in the chassis. Replace the four screws at the top of the backplane and the three screws in the floor of the chassis.

5. Reconnect all cables and return the hard drive trays to their bays in the front of the chassis.

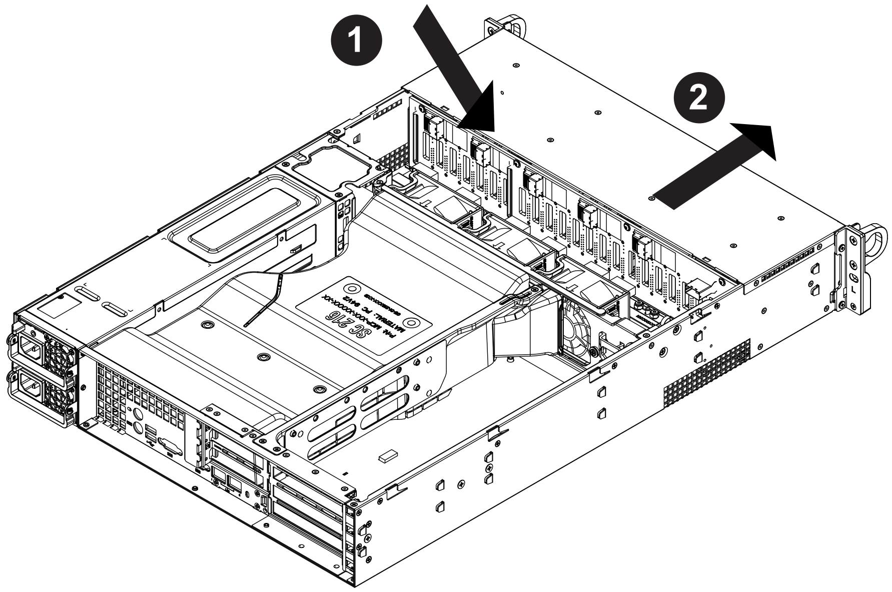


Figure 5-18: Installing the Backplane

Notes

Chapter 6

Rack Installation

6-1 Overview

This chapter provides a quick setup checklist to get your chassis up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time.

6-2 Unpacking the System

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold your chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

6-3 Preparing for Setup

The box your chassis was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Read this section in its entirety before beginning the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).

- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug hard drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

6-4 Rack Mounting Instructions

This section provides information on installing the SC216 chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

NOTE: This rail will fit a rack between 26.5" and 59" deep.

Identifying the Sections of the Rack Rails

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

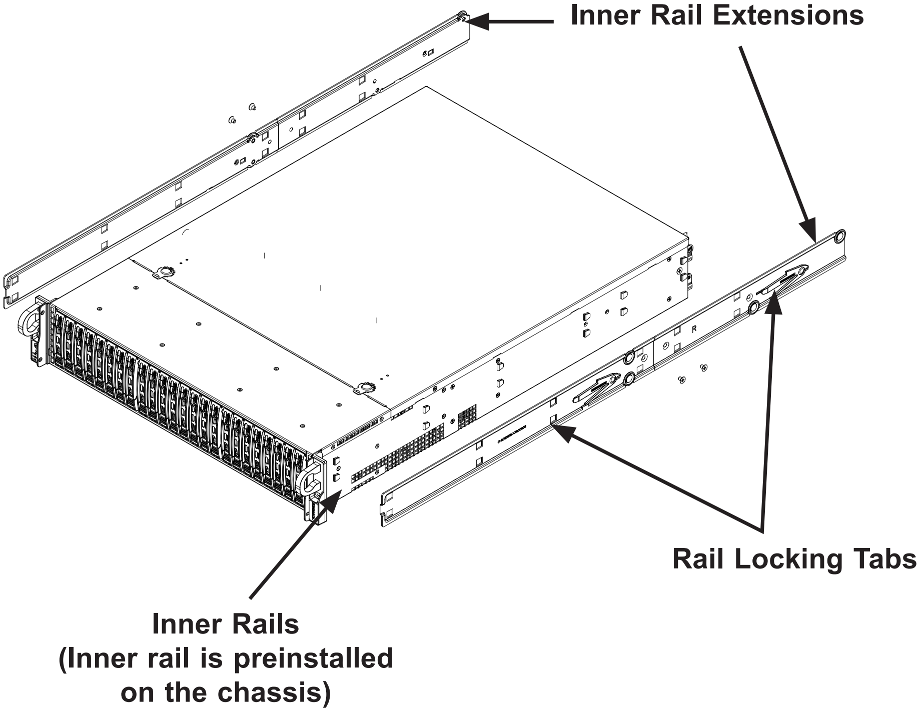


Figure 6-1. Identifying the Sections of the Rack Rails

Locking Tabs

Both chassis rails have a locking tab. The tabs lock the server into place when installed and pushed fully into the rack. These tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

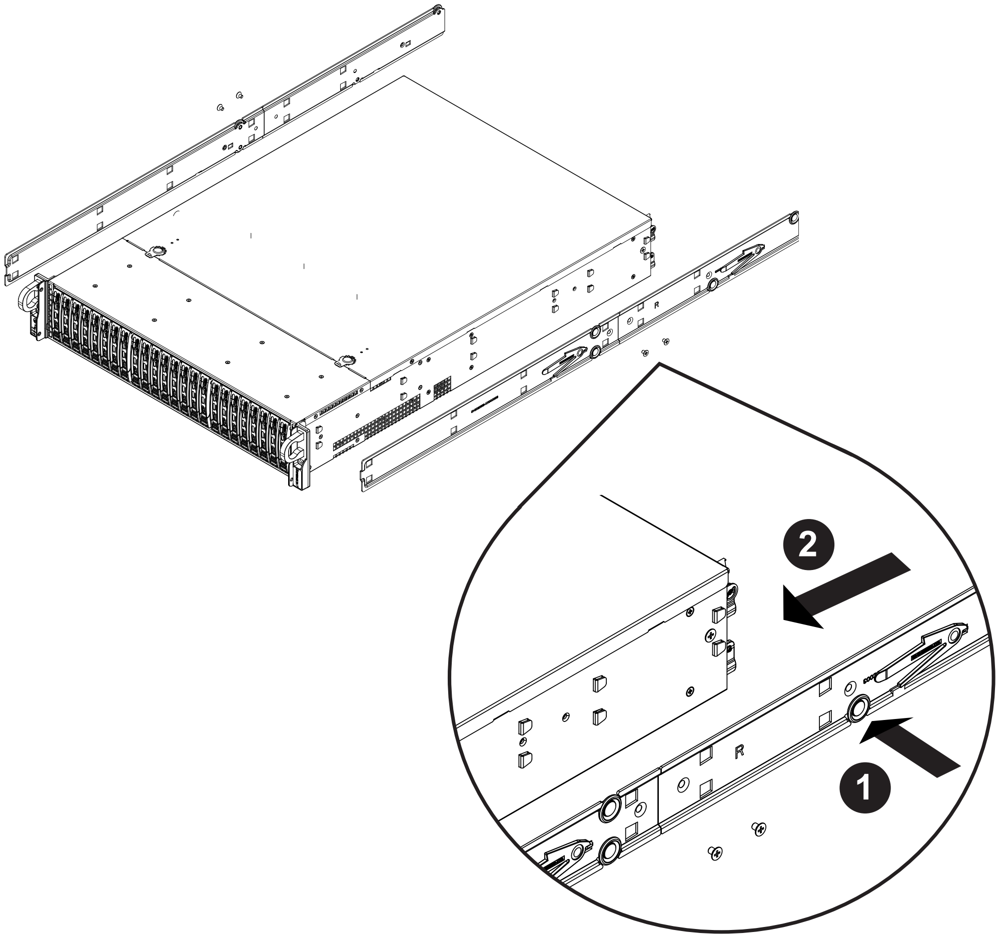


Figure 6-2. Identifying the Sections of the Rack Rails (right side rail shown)

Installing the Inner Rail Extension

The SC216 chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached and do not interfere with normal use of the chassis if you decide not to use a server rack. Attach the inner rail extension to stabilize the chassis within the rack.

Installing the Inner Rails

1. Place the inner rack extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.

2. Slide the extension toward the front of the chassis.

3. Secure the chassis with 2 screws as illustrated. Repeat steps for the other inner rail extension.

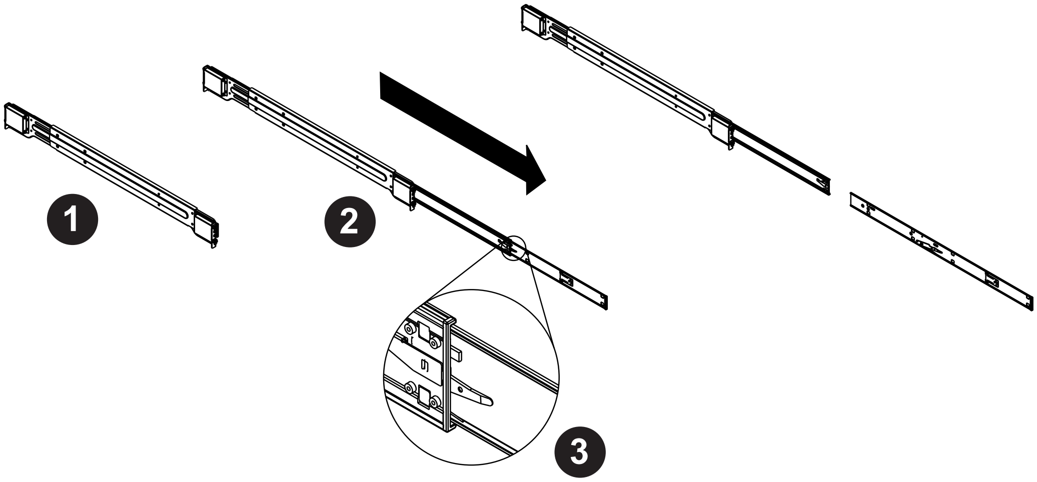


Figure 6-3: Extending and Releasing the Outer Rails

Outer Rack Rails

Outer rails attach to the server rack and hold the chassis in place. The SC216-comes equipped with quick-release outer rails which allow the chassis to be easily extended or removed from the rack.

Identifying the Outer Rails

1. Identify the two outer rack rails.

2. Pull out the end of the outer rail until it is fully extended as illustrated above.

3. Note the location of the release tab which will allow the outer rail extension to be separated from the outer rail. Do not release it at this time. If released, simply depress the release tab and slide the outer rail extension back into the outer rail.

4. Repeat steps 1-3 for the second outer rail.

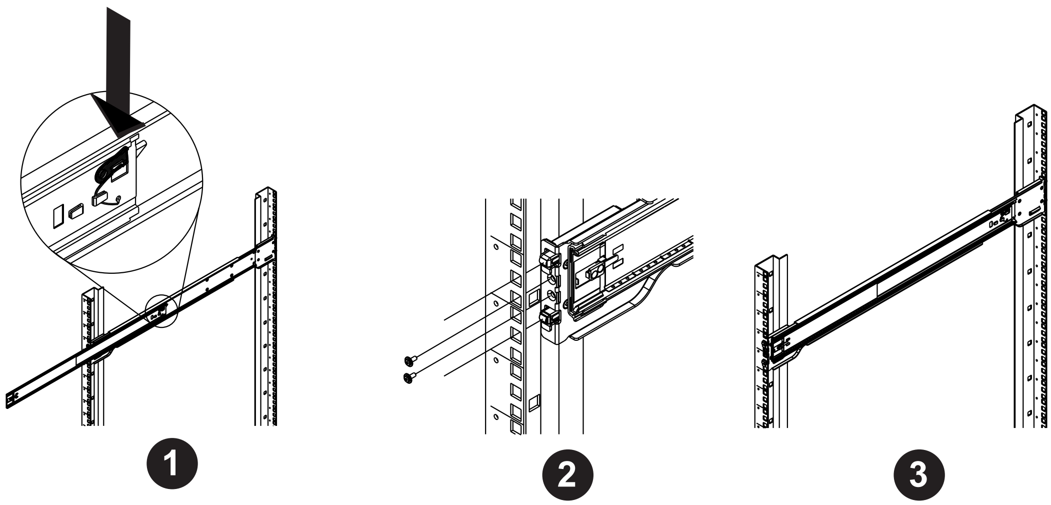


Figure 6-4: Extending and Releasing the Outer Rails

Attaching the Outer Rack Rails to the Rack

The outer rails attach to the rack and allow easy access to the chassis.

Installing the Outer Rails to the Rack

1. Press the button to retract the outer rail extensions.

2. Hang the hooks of the front portion of the outer rail onto the slots of the rack. If necessary, use screws to secure the outer rails to the rack, as illustrated above.

3. Hang the hooks of the rear portion of the outer rail onto the slots of the rack. Use screws as shown in step two to secure the rear of the outer rail to the rear of the rack.

4. Repeat steps 1-3 for the remaining outer rail.

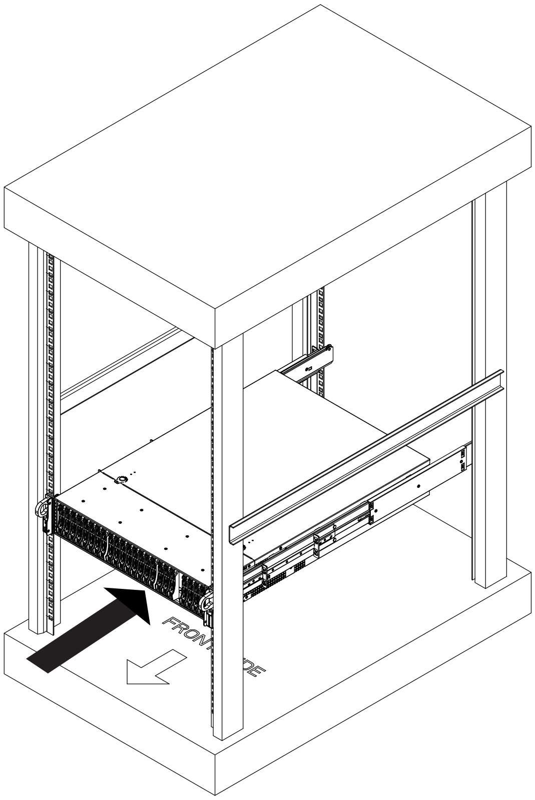


Figure 6-5: Installing the Rack Rails

Installing the Chassis into a Rack

1. Confirm that the inner rails and rail extensions are properly installed. Confirm that the outer rails and outer rail extensions are correctly installed on the rack.

2. Line chassis inner rails with the front of the rack outer rails.

3. Slide the chassis inner rails into the rack outer rails, keeping the pressure even on both sides. (It may be necessary to depress the locking tabs when inserting the rails). When the server has been pushed completely into the rack, you should hear the locking tabs "click" into the locked position.

4. If necessary, insert and tighten the thumbscrews that hold the front of the server to the rack.

Appendix A

SC216 Chassis Cables

A-1 Overview

This appendix lists supported cables for your chassis system. It only includes the most commonly used components and configurations. For more compatible cables, refer to the manufacturer of the motherboard you are using and our Web site at: www.supermicro.com.

A-2 Cables Included with SC216 Universal I/O Chassis

SC216A-R900UB, SC216A-R900LPB SC216E1-R900LPB, SC216E2-R900LPB SC216E1-R900UB, SC216E2-R900UB			
Part #	**Type**	**Length**	**Description**
CBL-0087	Ribbon, Round	20"	16 pin to 16 pin ribbon cable for control panel

A-3 Compatible Cables

These cables are compatible with the SC216 Chassis.

Alternate SAS/SATA Cables

Some compatible motherboards have different connectors. If your motherboard has only one SAS connector that the SAS/SATA cables must share, use one of the following cables. These cables must be purchased separately.

Cable Name: SAS Cable **Quantity:** 1

Part #: CBL-0175L
Alt. Name: "Big Four"

Description: This cable has one SFF-8484 (32 pin) connector on one end and 4 SAS connectors (7 pins each) at the other. This cable connects from the Host (motherboard or other controller) to the backplane SAS hard drive port.

Cable Name: SAS Cable **Quantity:** 1

Part #: CBL-0116
Alt. Name: iPass or "Small Four"

Description: This cable has one ipass (SFF-8087/mini-sas) connector (36 pins) at one end and 4 SAS connectors on one end. This cable connects from the Host (motherboard or other controller) to the backplane SAS hard drive port.

Extending Power Cables

Although Super Micro chassis are designed to be efficient and cost-effective, some compatible motherboards have power connectors located in different areas.

To use these motherboards you may have to extend the power cables to the mother boards. To do this, use the following chart as a guide.

Power Cable Extenders

Number of Pins	Cable Part #	Length
24 pin	CBL - 0042	7.9”(20 CM)
20 pin	CBL - 0059	7.9”(20 CM)
8 pin	CBL - 0062	7.9”(20 CM)
4 pin	CBL - 0060	7.9”(20 CM)

Front Panel to the Motherboard

The SC216 chassis includes a cable to connect the chassis front panel to the motherboard. If your motherboard uses a different connector, use the following list to find a compatible cable.

Front Panel to Motherboard Cable (Ribbon Cable)

Number of Pins (Front Panel)	Number of Pins (Motherboard	Cable Part #
16 pin	16 pin	CBL - 0049
16 pin	20 pin	CBL - 0048
20 pin	20 pin	CBL - 0047
16 pin	various*	CBL - 0068
20 pin	various*	CBL - 0067

* Split Cables: Use these cable if your motherboard requires several different connections from the front panel.

Notes

Appendix B

SC216 Power Supply Specifications

This appendix lists power supply specifications for the SC216 chassis.

SC216A-R900UB, SC216A-R900LPB SC216E1-R900LPB, SC216E2-R900LPB SC216E1-R900UB, SC216E2-R900UB	
	900W
MFR Part #	PWS-902-1R with PDB
Rated AC Voltage	100 - 240V 60 - 50Hz 11 - 4.5 Amp
+5V standby	4 Amp
+12V	75 Amp
+5V	45 Amp
+3.3V	24 Amp
-12V	0.6 Amp

Notes

Appendix C
SAS-216A Backplane Specifications

To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

C-1 ESD Safety Guidelines

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the backplane by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

C-2 General Safety Guidelines

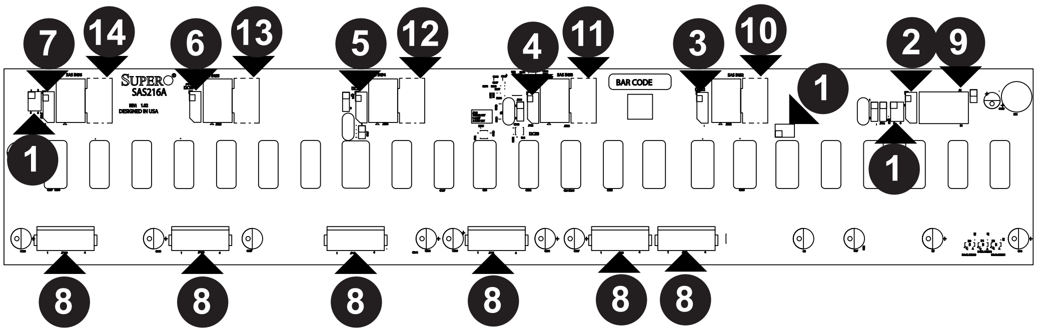
- Always disconnect power cables before installing or removing any components from the computer, including the backplane.
- Disconnect the power cable before installing or removing any cables from the backplane.
- Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

C-3 A Note to Users

- All images and layouts shown in this user's guide are based upon the latest PCB Revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this manual.

Jumper Settings and Pin Definitions

C-4 Front Connectors and Jumpers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SUPERO
SAS216A
BAR CODE

Figure C-1: Front Connectors

Front Connectors

1. Upgrade Connectors: JP69, JP78 and JP115
2. I²C Connector #1 (JP37)
3. I²C Connector #2 (JP95)
4. I²C Connector #3 (JP52)
5. I²C Connector #4 (JP96)
6. I²C Connector #5 (JP116)
7. I²C Connector #6 (JP117)
8. Power Connectors (4-pin): JP10, JP13, JP46, JP48 JP109, JP110
9. SAS IN#1 JSM1
10. SAS IN#2 JSM2
11. SAS IN#3 JSM3
12. SAS IN#4 JSM4
13. SAS IN#5 JSM5
14. SAS IN#6 JSM6

C-5 Front Connector and Pin Definitions

1. Upgrade Connectors

The upgrade connectors are designated JP69, JP78 and JP115 are used for manufacturer's diagnostic purposes only.

2. - 7. I^{2}C Connectors

The I^{2}C Connectors, designated JP37, JP95, JP52, JP96, JP115 and JP116 are used to monitor HDD activity and status. See the table on the right for pin definitions.

I^{2}C Connector Pin Definitions (JP37, JP95, JP52, JP96, JP115 and JP116)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

8. Backplane Main Power Connectors

The 4-pin connectors, designated JP10, JP13, JP46, JP48, JP109 and JP110 provide power to the backplane. See the table on the right for pin definitions.

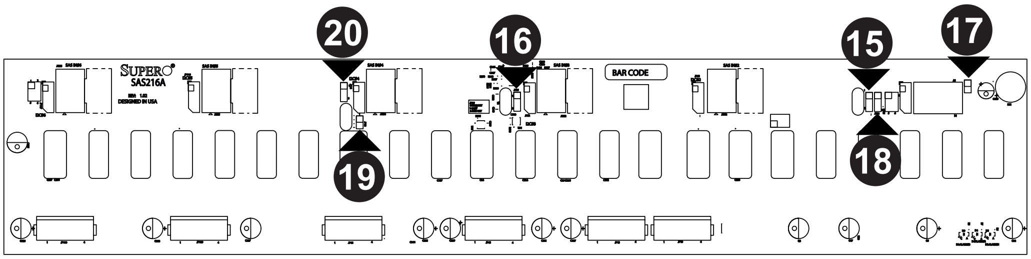
Backplane Main Power 4-Pin Connector (JP10, JP13, JP46, JP48, JP109 and JP110)	
Pin#	Definition
1	+12V
2 and 3	Ground
4	+5V

9. - 14. SAS IN Ports (Sideband included)

The SAS ports are used to connect the SAS drive cables. The six SAS IN ports are designated #JSM1 - #JSM6. Each port is also compatible with SATA drives.

Sideband Definitions (JSM1 - JSM6)			
Pin #	Definition	Pin #	Definition
A11	**SGPIO:** SDIN **I^{2}C:** Backplane Addressing (SB5)	B11	Controller ID (SB6)
A12	**SGPIO:** SDOUT **I^{2}C:** Reset (SB4)	B10	GND (SB2)
A9	GND (SB3)	B9	**SGPIO:** SLOAD **I^{2}C:**SDA (SB1)
A8	Backplane ID (SB7)	B8	**SGPIO:** SCLOCK **I^{2}C:**SCL (SB0)

C-6 Front Jumper Locations and Pin Definitions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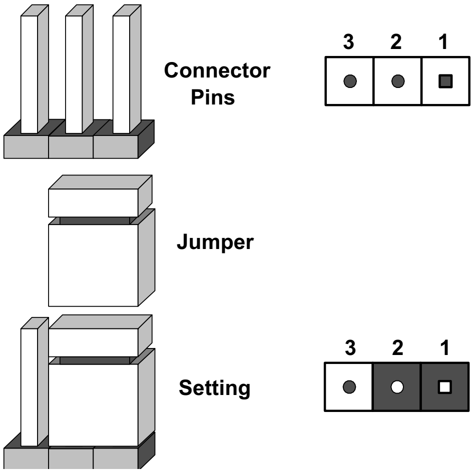
SUPERO
SAS216A
DESIGNED IN USA
BAR CODE

Figure C-2: Front Jumpers

15. Chip Reset JP36 1-2 Reset, 2-3 No Reset (Not populated)
16. Chip Reset JP35 1-2 Reset, 2-3 No Reset (Not populated)
17. Buzzer Reset JP18
18. JP84 1-2 SGPIO, 2-3 I^2C
19. JP80 I^2C Addr - On C0, Off C2 (Not populated)
20. JP50 Chip Reset 1-2 Reset, 2-3 No Reset (Not populated)

Explanation of Jumpers

To modify the operation of the backplane, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.


Connector Pins
3 2 1
Jumper
Setting
3 2 1

I^{2}C and SGPIO Modes and Jumper Settings

This backplane can utilize I^{2}C or SGPIO. SGPIO is the default mode and can be used without making changes to your jumper. The following information details which jumper must be configured to use SGPIO mode or restore your backplane to I^{2}C mode.

SGPIO Setting (Default)

Jumper	Jumper Setting	Note
JP84	1-2	SGPIO Mode Setting

I^{2}C Setting

Jumper	Jumper Setting	Note
JP84	2-3	I^{2}C Setting

Front LED Indicators

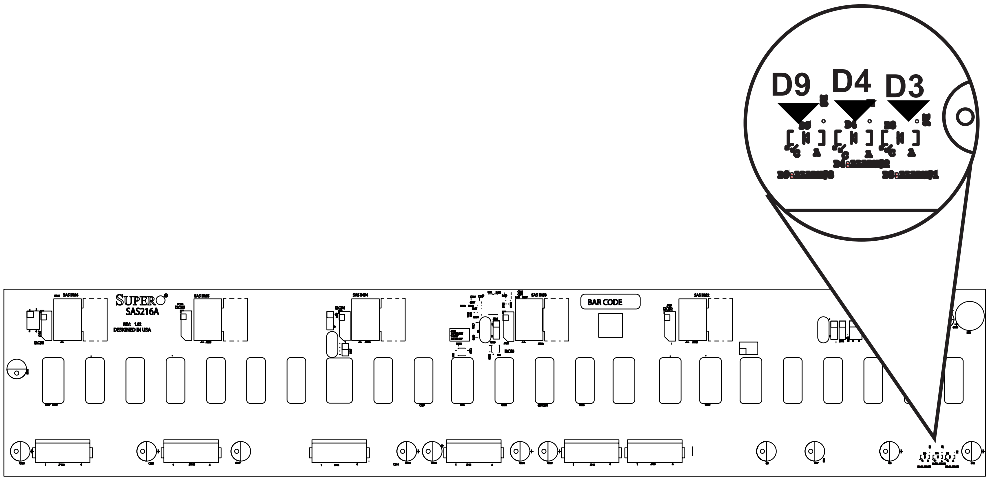

D9
D4
D3
SUPERO
SAS216A
BAR CODE

Figure C-3: Front LEDs

Front Panel LEDs		
LED	**STATE**	**SPECIFICATION**
D3	On	Alarm #1
D4	On	Alarm #2
D9	On	Alarm #3

C-7 Rear Components, Connectors and LED Indicators

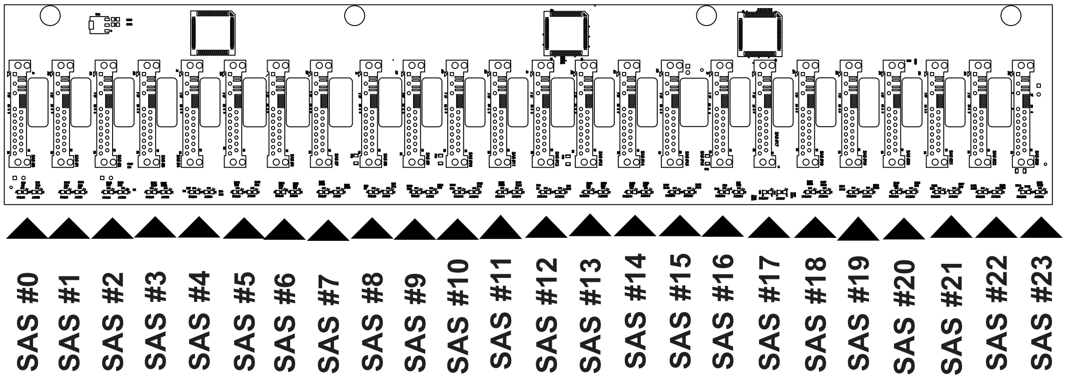

SAS #0
SAS #1
SAS #2
SAS #3
SAS #4
SAS #5
SAS #6
SAS #7
SAS #8
SAS #9
SAS #10
SAS #11
SAS #12
SAS #13
SAS #14
SAS #15
SAS #16
SAS #17
SAS #18
SAS #19
SAS #20
SAS #21
SAS #22
SAS #23

Figure C-4: Rear Components

Rear SAS/SATA Connectors			
Rear Connector	**SAS Drive Number**	**Rear Connector**	**SAS Drive Number**
SAS #0	SAS/SATA HDD #0	SAS #12	SAS/SATA HDD #12
SAS #1	SAS/SATA HDD #1	SAS #13	SAS/SATA HDD #13
SAS #2	SAS/SATA HDD #2	SAS #14	SAS/SATA HDD #14
SAS #3	SAS/SATA HDD #3	SAS #15	SAS/SATA HDD #15
SAS #4	SAS/SATA HDD #4	SAS #16	SAS/SATA HDD #16
SAS #5	SAS/SATA HDD #5	SAS #17	SAS/SATA HDD #17
SAS #6	SAS/SATA HDD #6	SAS #18	SAS/SATA HDD #18
SAS #7	SAS/SATA HDD #7	SAS #19	SAS/SATA HDD #19
SAS #8	SAS/SATA HDD #8	SAS #20	SAS/SATA HDD #20
SAS #9	SAS/SATA HDD #9	SAS #21	SAS/SATA HDD #21
SAS #10	SAS/SATA HDD #10	SAS #22	SAS/SATA HDD #22
SAS #11	SAS/SATA HDD #11	SAS #23	SAS/SATA HDD #23

Rear LED Indicators

Rear LED	Hard Drive Activity	Failure LED
SAS #0	D12	D5
SAS #1	D22	D23
SAS #2	D40	D37
SAS #3	D102	D107
SAS #4	D13	D6
SAS #5	D24	D29
SAS #6	D41	D38
SAS #7	D104	D108
SAS #8	D14	D7
SAS #9	D25	D30
SAS #10	D42	D39
SAS #11	D106	D109
SAS #12	D15	D8
SAS #13	D26	D31
SAS #14	D87	D88
SAS #15	D111	D110
SAS #16	D18	D19
SAS #17	D27	D32
SAS #18	D100	D103
SAS #19	D118	D119
SAS #20	D21	D20
SAS #21	D28	D33
SAS #22	D101	D105
SAS #23	D120	D121

Notes

Appendix D
SAS-216EL Backplane Specifications

D-1 Overview of the SAS-216EL1/EL2 Backplanes

The SAS-216EL1/EL2 series of backplanes consists of a SAS-216EB backplane (A) with one or two SAS-216EL daughter cards (B and C) mounted on the rear of the backplane.

The SAS-216EL1 model consists of the SAS-216EB backplane (A) and **one** SAS-216EL daughter card (C), mounted on the right-hand side of the backplane.

The SAS-216EL2 model consists of the SAS-216EB backplane (A), and **two** SAS216EL daughter cards (B and C), mounted on the rear of the backplane.

Components on the front side of the SAS-216ELB backplane include 24 SAS connectors and their respecitve activity and failure LEDs. Components on the rear side of the backplane include jumpers and power and fan connectors. The daughter card's components include SAS ports, flash and expander chips, and mode select jumpers.

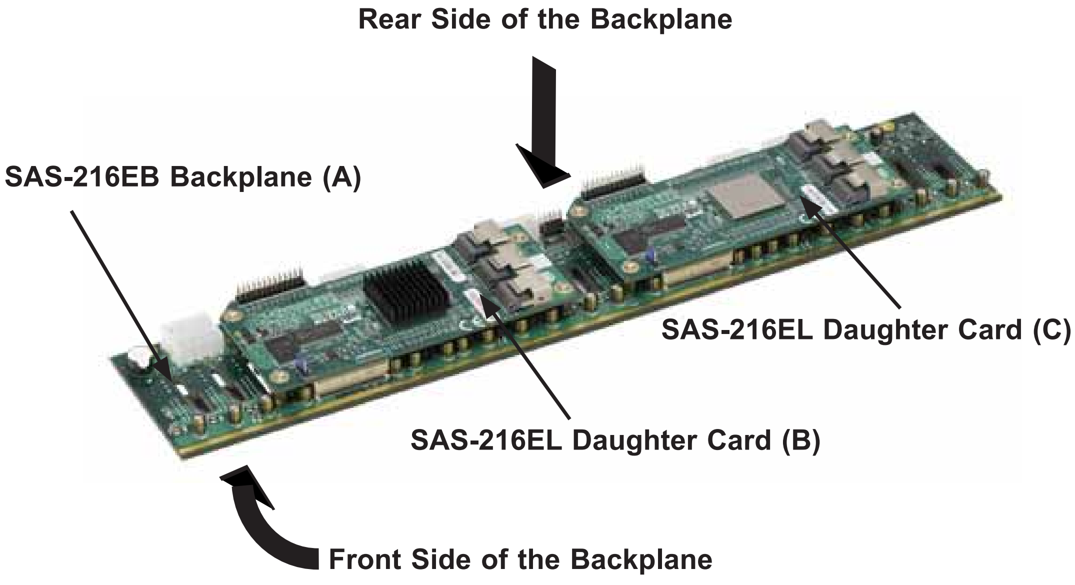

Rear Side of the Backplane
SAS-216EB Backplane (A)
SAS-216EL Daughter Card (C)
SAS-216EL Daughter Card (B)
Front Side of the Backplane

Figure D-1: The SAS-216EL1/EL2 Backplane

Safety Guidelines

To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

D-1 ESD Safety Guidelines

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the backplane and daughter cards by their edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

D-2 General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the backplane.
- Disconnect the power cable before installing or removing any cables from the backplane.
- Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

D-3 An Important Note to Users

- All images and layouts shown in this user's guide are based upon the latest PCB revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this manual.

Jumper Settings and Pin Definitions

D-4 Rear Components, Connectors and Jumpers

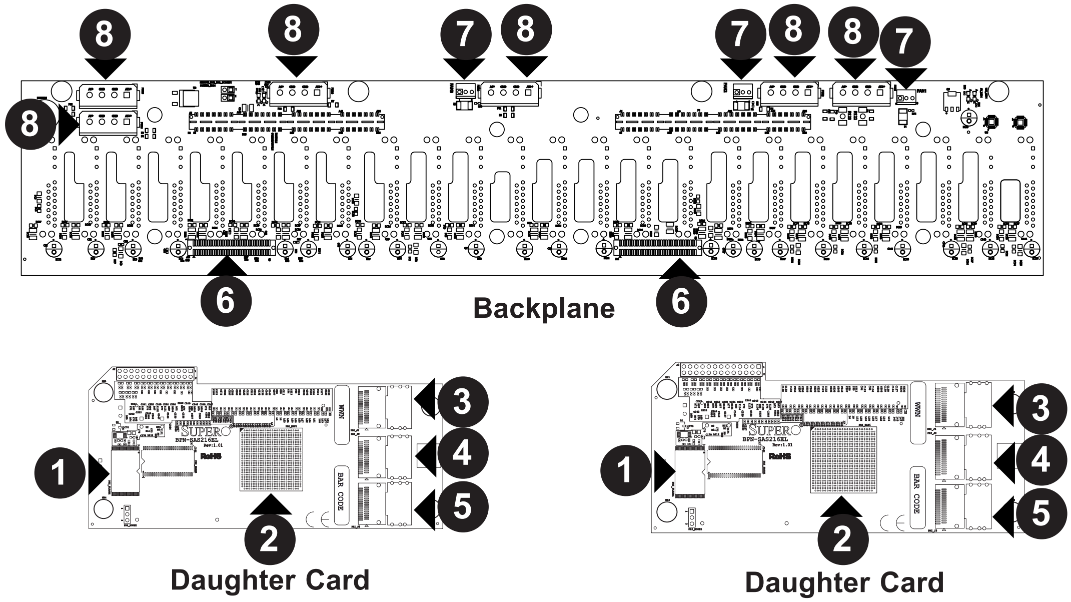

8
8
8
7
8
7
8
8
7
6
Backplane
6
3
4
5
1
2
Daughter Card
3
4
5
1
2
Daughter Card

Figure D-2: Front Connectors on Backplane and Daughter Cards

Rear Components and Connectors

Components

1. Primary Flash Chip
2. Primary Expander Chip
3. SAS Port: PRI_J1
4. SAS Port: PRI_J2
5. SAS Port: PRI_J3
6. EPP Connectors: J24 and J25
7. Fan Connectors: Fan1, Fan2, and Fan3
8. Power Connectors: PWR1 - PWR6

D-5 Rear Connector and Pin Definitions

1. Primary Flash Chips

The Primary Flash Chip enhances the backplane memory.

2. Expander Chips

This Expander Chip allows the backplane to support dual ports, cascading, and failover.

3. - 5. SAS Ports

The primary and secondary sets of SAS ports provide expander features including cascading and failover From right to left the ports are Primary 1/2/3 and Secondary 1/2/3.

6. EPP Ports

The EPP ports are used for manufacturer diagnostic purposes only.

7. Fan Connectors

The 3-pin connectors, designated FAN1, FAN2, and FAN3, provide power to the fans. See the table on the right for pin definitions.

Fan Connectors

Pin#	Definition
1	Ground
2	+12V
3	Tachometer

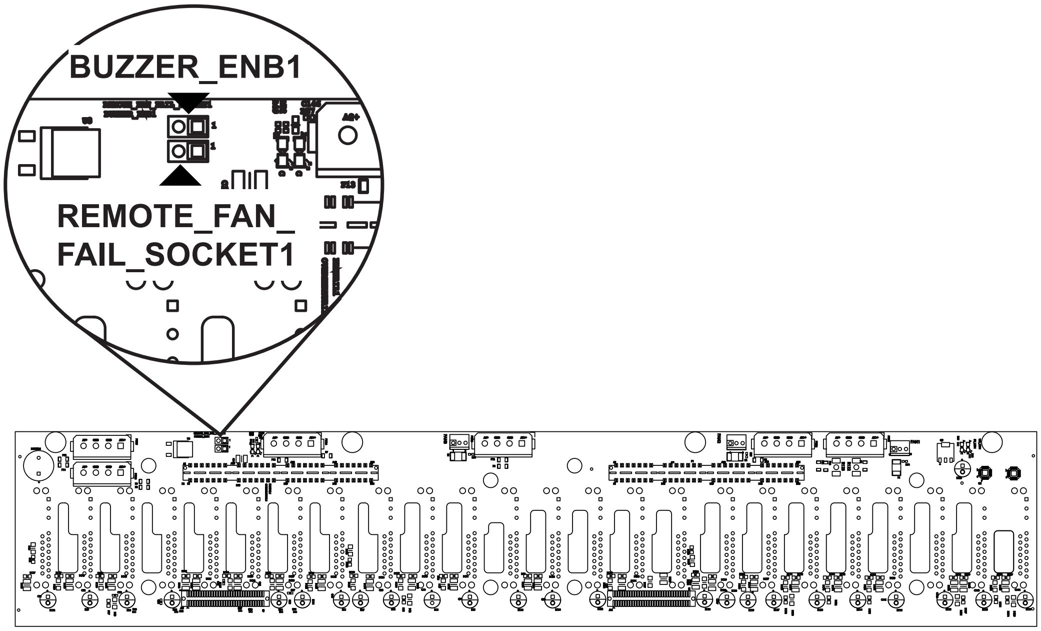
8. Backplane Main Power Connectors

The 4-pin connectors, designated PWR1, PWR2, PWR3, PWR4, PWR5, and PWR6, provide power to the backplane. See the table on the right for pin definitions.

Backplane Main Power 4-Pin Connector

Pin#	Definition
1	+12V
2 and 3	Ground
4	+5V

D-6 Rear Jumper Locations and Pin Definitions


BUZZER_ENB1
REMOTE_FAN_
FAIL_SOCKET1

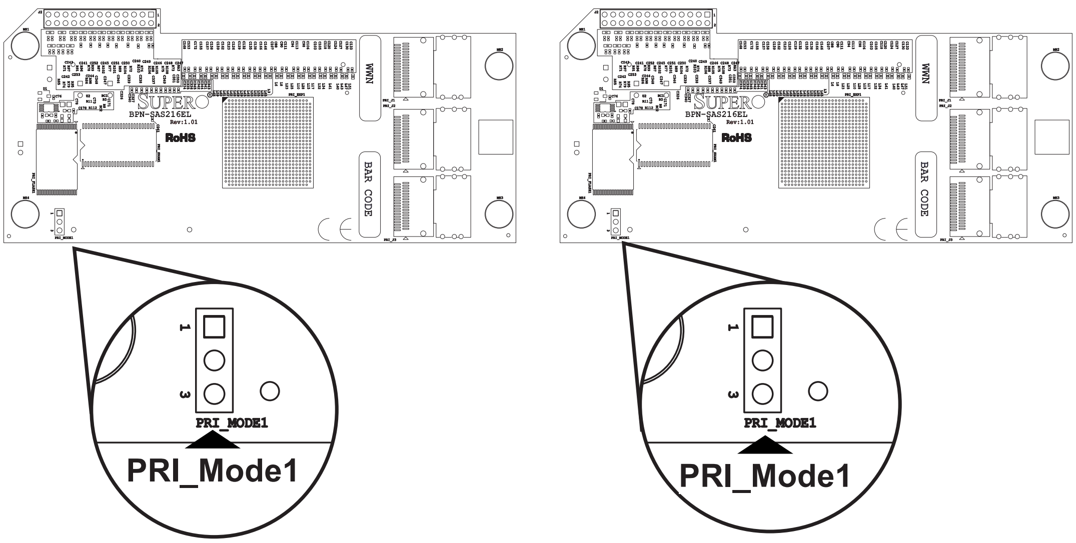
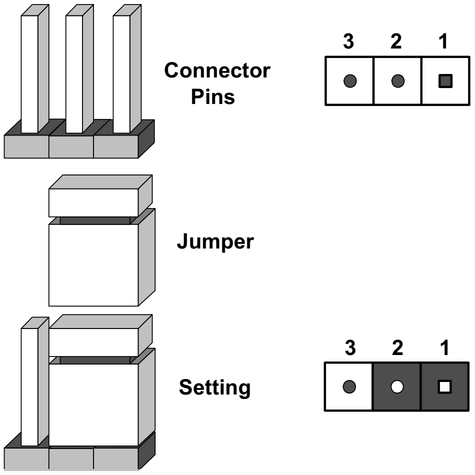

SUPERO
BPN-SAS216EL
RoHS
BAR CODE
1
3
PRI_MODE1
PRI_Mode1
1
3
PRI_MODE1
PRI_Mode1

Figure D-3: Front Jumper Locations and Pin Defimitions

Explanation of Jumpers


Connector
Pins
3 2 1
Jumper
Setting
3 2 1

To modify the operation of the backplane, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

General Jumper Settings

Jumper	Jumper Settings	Note
PRI_MODE1	1-2	Factory Setting Do not change
BUZZER_ENB1	Open: Disable Closed: Enable	Buzzer Enable

Socket Settings

Socket	Socket Setting	Note
REMOTE_FAN_FAIL_SOCKET1	Connected	Front Panel Fan Fail indicator (Optional)

Front Panel LEDs

LED	STATE	SPECIFICATION
12V_LED1	OFF	Backplane power failure. Light is on during normal operation.
5V_LED1	OFF	Backplane power failure. Light is on during normal operation.

D-7 Front Connectors and LED Indicators

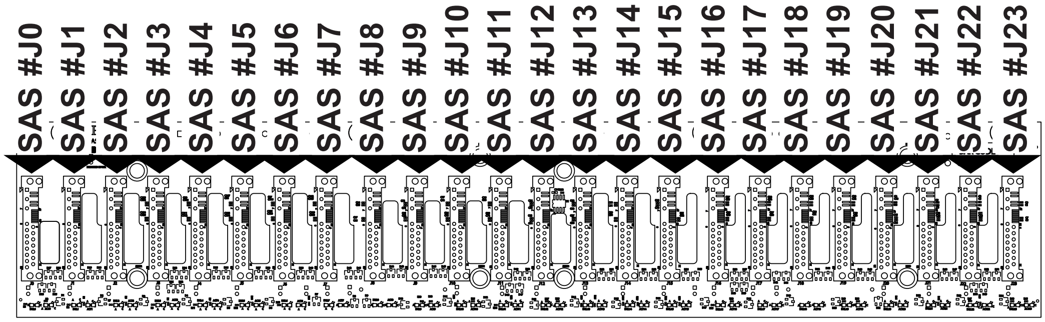

SAS #J0
SAS #J1
SAS #J2
SAS #J3
SAS #J4
SAS #J5
SAS #J6
SAS #J7
SAS #J8
SAS #J9
SAS #J10
SAS #J11
SAS #J12
SAS #J13
SAS #J14
SAS #J15
SAS #J16
SAS #J17
SAS #J18
SAS #J19
SAS #J20
SAS #J21
SAS #J22
SAS #J23

Figure D-4: Rear Connectors

Rear SAS/SATA Connectors			
Front Connector	**SAS Drive Number**	**Front Connector**	**SAS Drive Number**
SAS #J0	SAS/SATA HDD #1	SAS #J12	SAS/SATA HDD #13
SAS #J1	SAS/SATA HDD #2	SAS #J13	SAS/SATA HDD #14
SAS #J2	SAS/SATA HDD #3	SAS #J14	SAS/SATA HDD #15
SAS #J3	SAS/SATA HDD #4	SAS #J15	SAS/SATA HDD #16
SAS #J4	SAS/SATA HDD #5	SAS #J16	SAS/SATA HDD #17
SAS #J5	SAS/SATA HDD #6	SAS #J17	SAS/SATA HDD #18
SAS #J6	SAS/SATA HDD #7	SAS #J18	SAS/SATA HDD #19
SAS #J7	SAS/SATA HDD #8	SAS #J19	SAS/SATA HDD #20
SAS #J8	SAS/SATA HDD #9	SAS #J20	SAS/SATA HDD #21
SAS #J9	SAS/SATA HDD #10	SAS #J21	SAS/SATA HDD #22
SAS #J10	SAS/SATA HDD #11	SAS #J22	SAS/SATA HDD #23
SAS #J11	SAS/SATA HDD #12	SAS #J23	SAS/SATA HDD #24

Front LED Indicators

Front LED	Hard Drive Activity	Failure LED
SAS #J0	ACT #1	FAIL #1
SAS #J1	ACT #2	FAIL #2
SAS #J2	ACT #3	FAIL #3
SAS #J3	ACT #4	FAIL #4
SAS #J4	ACT #5	FAIL #5
SAS #J5	ACT #6	FAIL #6
SAS #J6	ACT #7	FAIL #7
SAS #J7	ACT #8	FAIL #8
SAS #J8	ACT #9	FAIL #9
SAS #J9	ACT #10	FAIL #10
SAS #J10	ACT #11	FAIL #11
SAS #J11	ACT #12	FAIL #12
SAS #J12	ACT #13	FAIL #13
SAS #J13	ACT #14	FAIL #14
SAS #J14	ACT #15	FAIL #15
SAS #J15	ACT #16	FAIL #16
SAS #J16	ACT #17	FAIL #17
SAS #J17	ACT #18	FAIL #18
SAS #J18	ACT #19	FAIL #19
SAS #J19	ACT #20	FAIL #20
SAS #J20	ACT #21	FAIL #21
SAS #J21	ACT #22	FAIL #22
SAS #J22	ACT #23	FAIL #23
SAS #J23	ACT #24	FAIL #24

D-8 Front Connectors and Jumpers

Front Components

1. Power Connectors: PWR1, PWR2, PWR3, PWR4, PWR5, and PWR6

Dual Port and Cascading Configurations

D-9 Single and Dual Port Expanders

Single Ports

SAS-216EL1 backplanes have a single-port expander on the daughter card, that accesses all 24 drives and supports cascading.

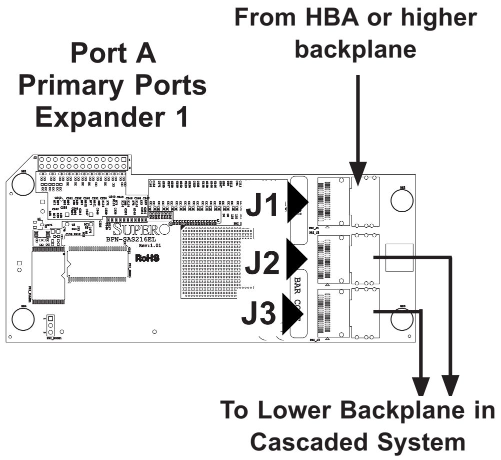

From HBA or higher backplane
Port A
Primary Ports
Expander 1
SUPERO
BPN-SAS216EL
Rev:1.01
RoHS
J1
J2
J3
To Lower Backplane in Cascaded System

Figure D-5: SAS-216EL2 Single Port Configuration

Dual Ports

SAS-216EL2 backplanes have dual-port expanders on the daughter cards, that access all 24 drives. These dual-port expanders support cascading, failover, and recovery.

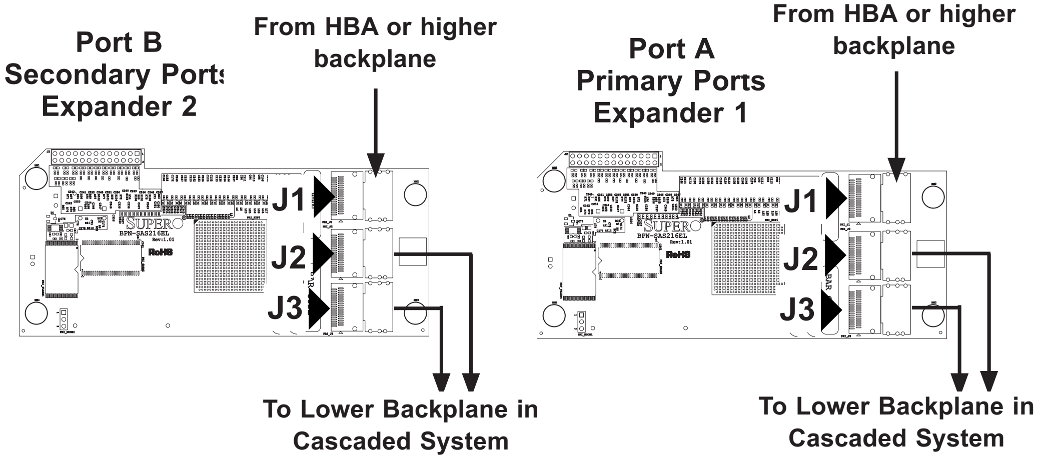

Port B
Secondary Ports
Expander 2
From HBA or higher backplane
SUPERO
BPN-SAS216EL
Rev:1.01
RoHS
J1
J2
J3
To Lower Backplane in Cascaded System
Port A
Primary Ports
Expander 1
From HBA or higher backplane
SUPERO
BPN-SAS216EL
Rev:1.01
RoHS
J1
J2
J3
To Lower Backplane in Cascaded System

Figure D-6: SAS-216EL2 Dual Port Configuration

D-10 Failover

The SAS-216EL2 backplane has two expanders which allow effective failover and recovery.

Single Host Bus Adapter

In a single host bus configuration, the backplane connects to one Host Bus Adapter (HBA).

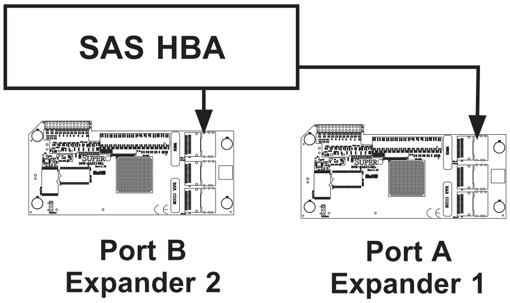

SAS HBA
Port B
Expander 2
Port A
Expander 1

Figure D-7: Single HBA

Single Host Bus Adapter Failover

If the expander or data path in Port A fails, the system automatically switches to Port B.

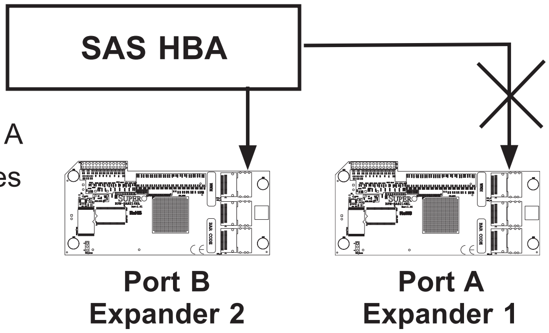

SAS HBA
Port B
Expander 2
Port A
Expander 1

Figure D-8: Single HBA Failover

Dual Host Bus Adapter

In a Dual Host Bus Configuration, the backplane connects to two Host Bus Adapters (HBA).

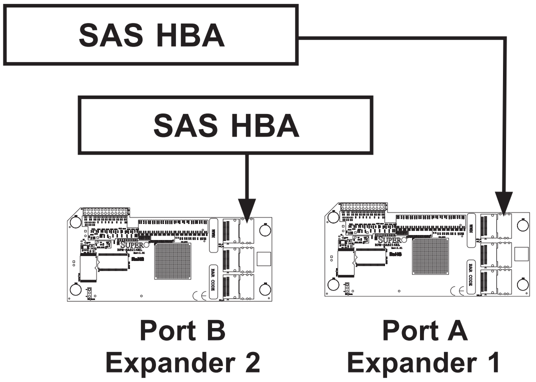

SAS HBA
SAS HBA
Port B
Expander 2
Port A
Expander 1

Figure D-9: Dual HBA

Dual Host Bus Adapter Failover

If the Expander or data path in Port A fails, the system automatically switches to Port B. This maintains a full connection to all drives.

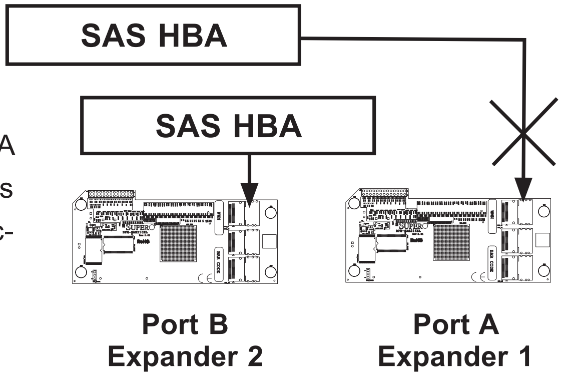

SAS HBA
SAS HBA
Port B
Expander 2
Port A
Expander 1

Figure D-10: Dual HBA Failover

D-11 Chassis Power Card and Support Cables

Chassis Power Card

In a cascaded configuration, the first chassis includes a motherboard and at least one Host Bus Adapter (HBA). Other servers in this enclosed system, include a power card. This section describes the supported power card for the SAS-216 series backplane.

For more information, see the Supermicro Web site at http://www.supermicro.com.

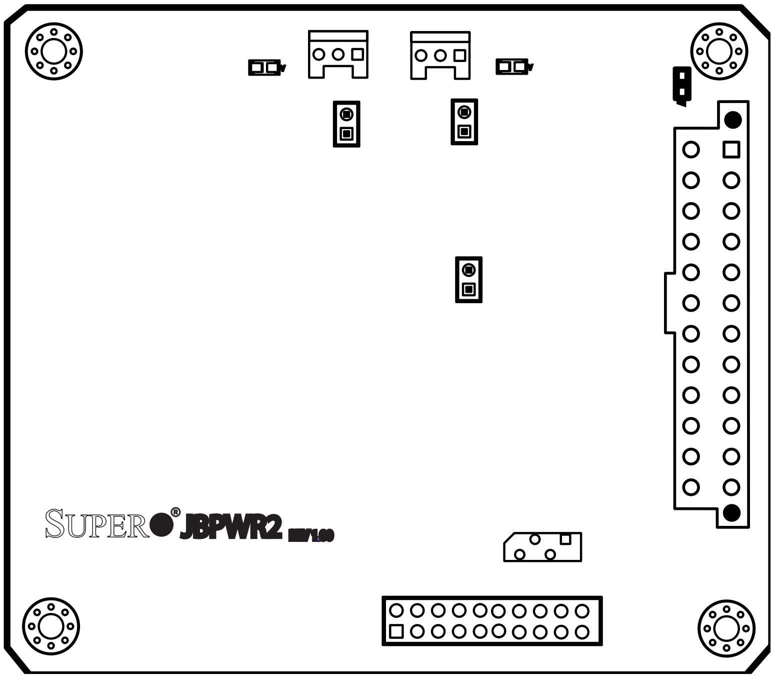


Figure D-11: Chassis Power Card (Sold Separately)

Power Card		
Part Number	**Part Type**	**Where Used**
CSE-PTJBOD-CB1	Power Card	Allows the chassis to be in a JBOD (Just a Bunch of Drives) system.

Connectioning an Internal Host Bus Adapter to the Backplane

The following section lists the most common cables used to connect the Host Bus Adapter (HBA) to the backplane.

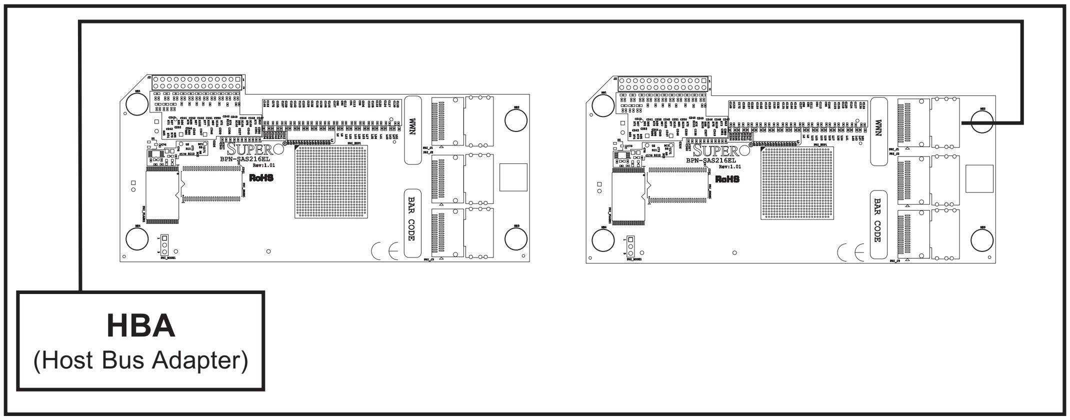

HBA
(Host Bus Adapter)
SUPER
BPN-SAS216EL
RoHS
BAR CODE

Figure D-12: Single Internal Host Bus Adapter

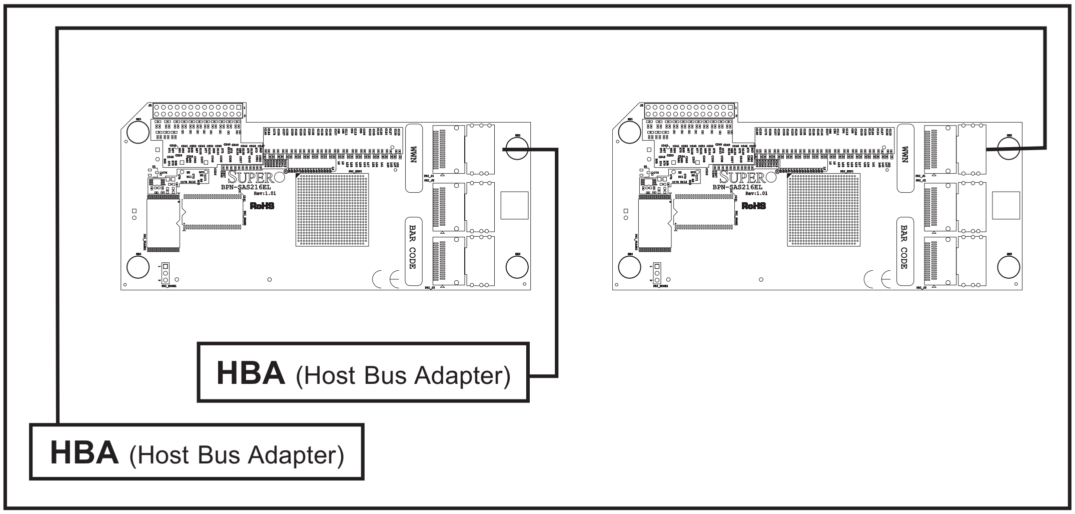

HBA (Host Bus Adapter)
HBA (Host Bus Adapter)
SUPER
BPN-SAS216EL
RoHS
BAR CODE

Figure D-13: Dual Internal Host Bus Adapter

Supported Internal HBA Cables

Use the following listed cables to create connections between the internal HBA and SAS-216EL backplane. The cables required depend on the HBA connector.

Cable Name: IPASS TO 4-LANE
Part #: CBL-0117L
Length: 46 cm (18 inches)
Description: This cable has one SFF-8484 (32 pin) connector on one end and ipass (SFF-8087/mini-sas) connector (36 pins) at the other. This cable connects from the HBA to the SAS-216EL backplane

Cable Name: IPASS (mini SAS) TO IPASS (mini SAS)

Part #: CBL-0108L-02 **Length:** 39 cm (15 inches)
Part #: CBL-0109L-02 **Length:** 22 cm (9 inches)
Part #: CBL-0110L-02 **Length:** 18 cm (7 inches)

Description: This cable has an ipass (SFF-8087/mini-sas) connector (36 pins) at each end. It connects from the HBA to the SAS-216EL backplane.

Connecting an External Host Bus Adapter to the Backplane

This backplane supports external Host Bus Adapters. In this configuration, the HBA and the backplane are in different physical chassis. This allows a JBOD (Just a Bunch Of Drives) configuration from an existing system.

Single External Host Bus Adapter

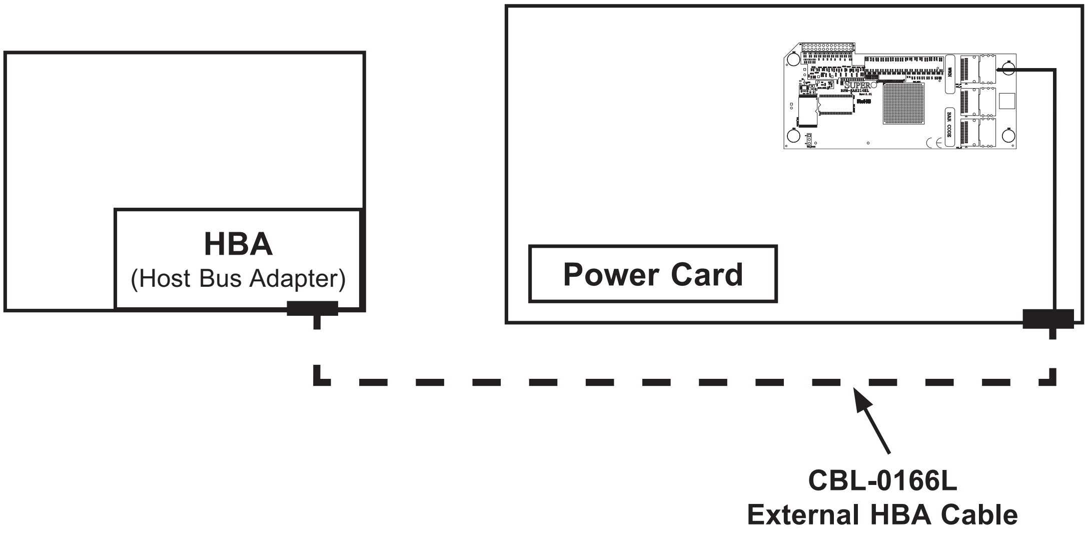

HBA
(Host Bus Adapter)
Power Card
CBL-0166L
External HBA Cable

Figure D-14: Single External Host Adapter

Dual External Host Bus Adapter

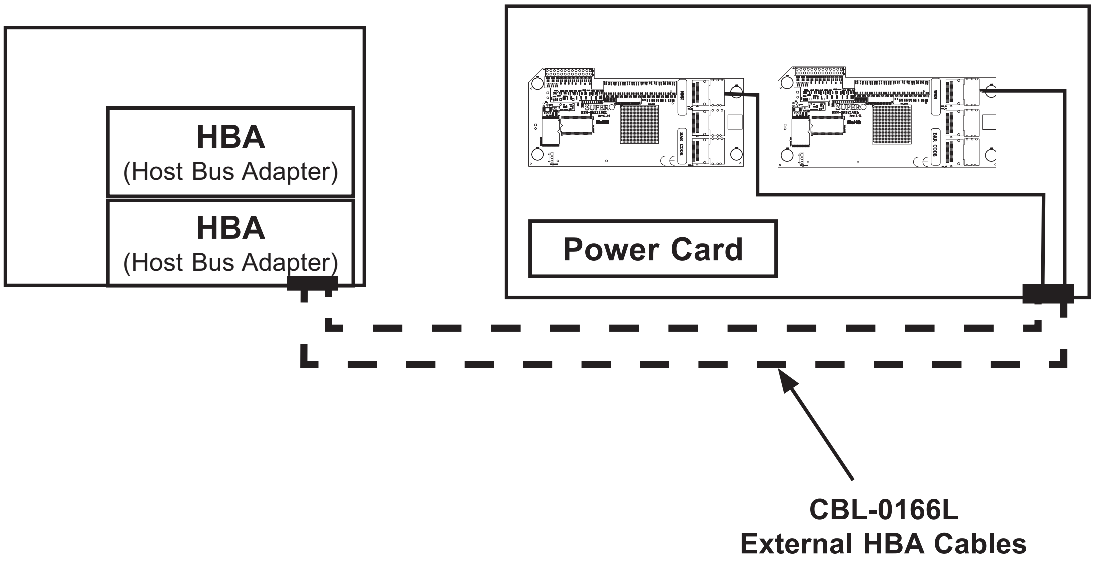

HBA
(Host Bus Adapter)
HBA
(Host Bus Adapter)
Power Card
CBL-0166L
External HBA Cables

Figure D-15: Dual External Host Bus Adapter

Supported External HBA to Backplane Cable

Use the following cable if your external HBA has an InfiniBand connector.

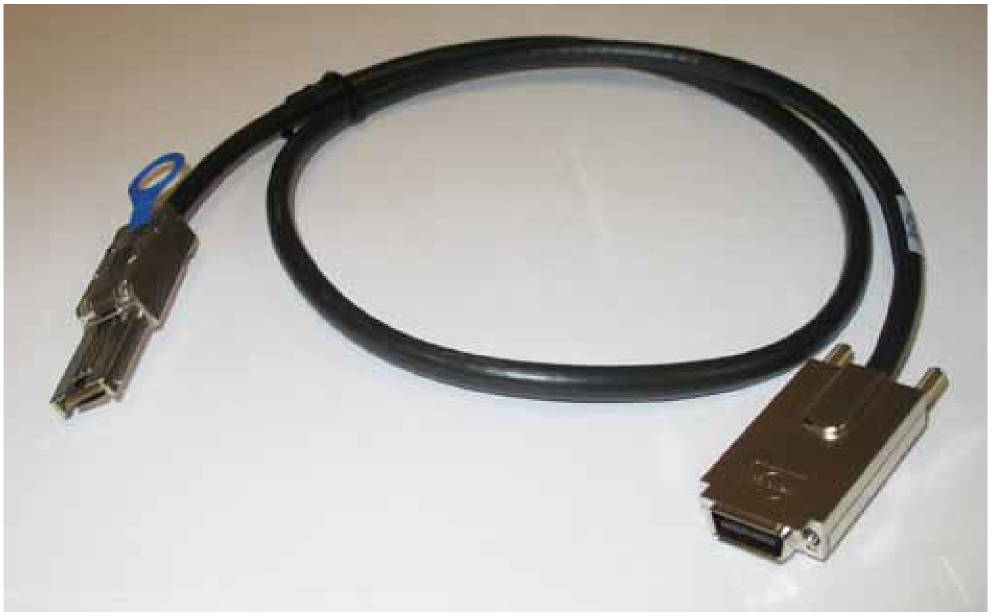


Figure D-16: SAS InfiniBand Cable (CBL-0200L)

Cable Name: SAS InfiniBand to Mini SAS X4 1M cable, PBF
Part #: CBL-0200L
Length: 1 meter

Description: This cable has an InfiniBand connector (SFF-8470) on one end and an SFF-8088-1X (26-pins) at the other end.

Connecting Multiple Backplanes in a Single Channel Environment

This section describes the cables used when cascading from a single HBA. These connections use CBL-0167L internal cables and CBL-0166L external cables.

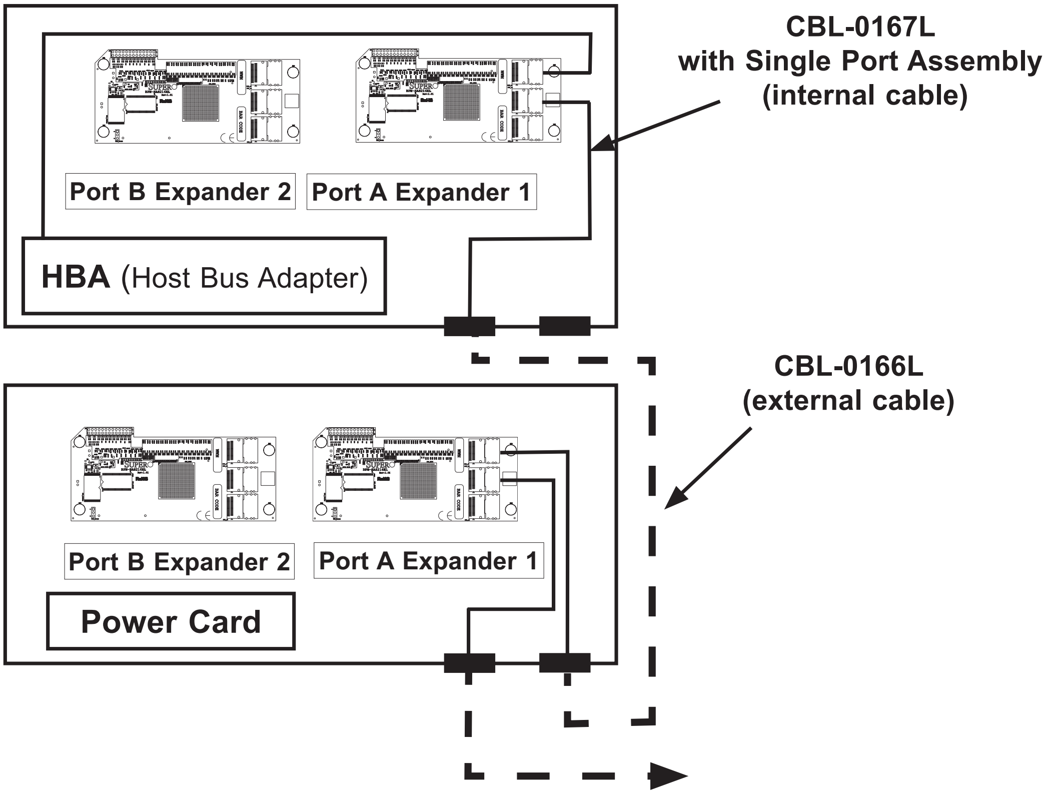

CBL-0167L
with Single Port Assembly
(internal cable)
Port B Expander 2
Port A Expander 1
HBA (Host Bus Adapter)
CBL-0166L
(external cable)
Port B Expander 2
Port A Expander 1
Power Card

Figure D-17: Single HBA Configuration

Single HBA Configuration Cables

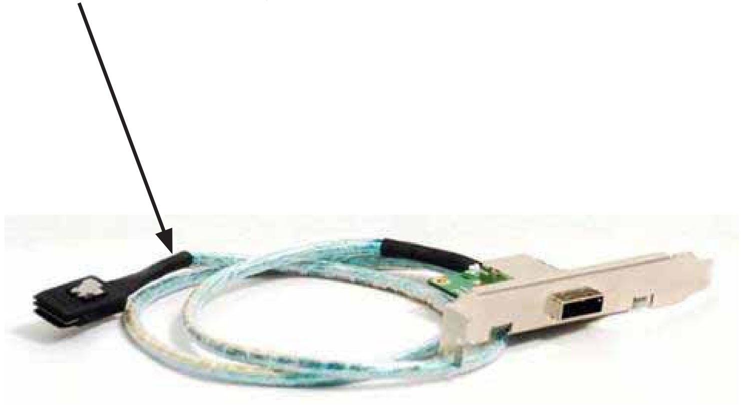


Figure D-18: Single Port Internal Cable (CBL-0167L)

Cable Name: SAS EL2/EL1 Backplane Cable (Internal) with 2-port Cascading Cable, 68 cm

Part #: CBL-0167L (SFF-8087 to SFF-8088 x1)
Ports: Single
Placement: Internal cable

Description: Internal cable. Connects the backplane to the Host Bus Adapter (HBA) or external port. Used in single port environments

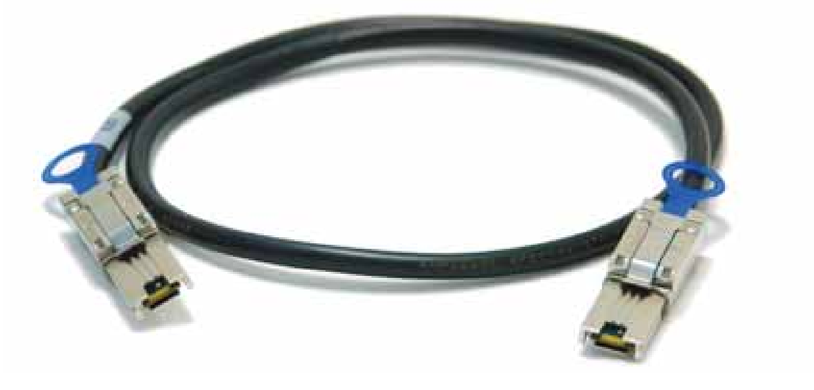


Figure D-19: External Cable (CBL-0166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68cm

Part #: CBL-0166L (SFF-8088 1x to SFF-8088 x1)
Ports: Single or Dual
Placement: External cable

Description: External cascading cable. Connects ports between servers. With most connectors, use one cable for single port connections and two cables for dual port connections.

Connecting Multiple Backplanes in a Dual Channel Environment

This section describes the cables used when cascading from dual HBAs. These connections use CBL-0168L internal cables and CBL-0166L external cables.

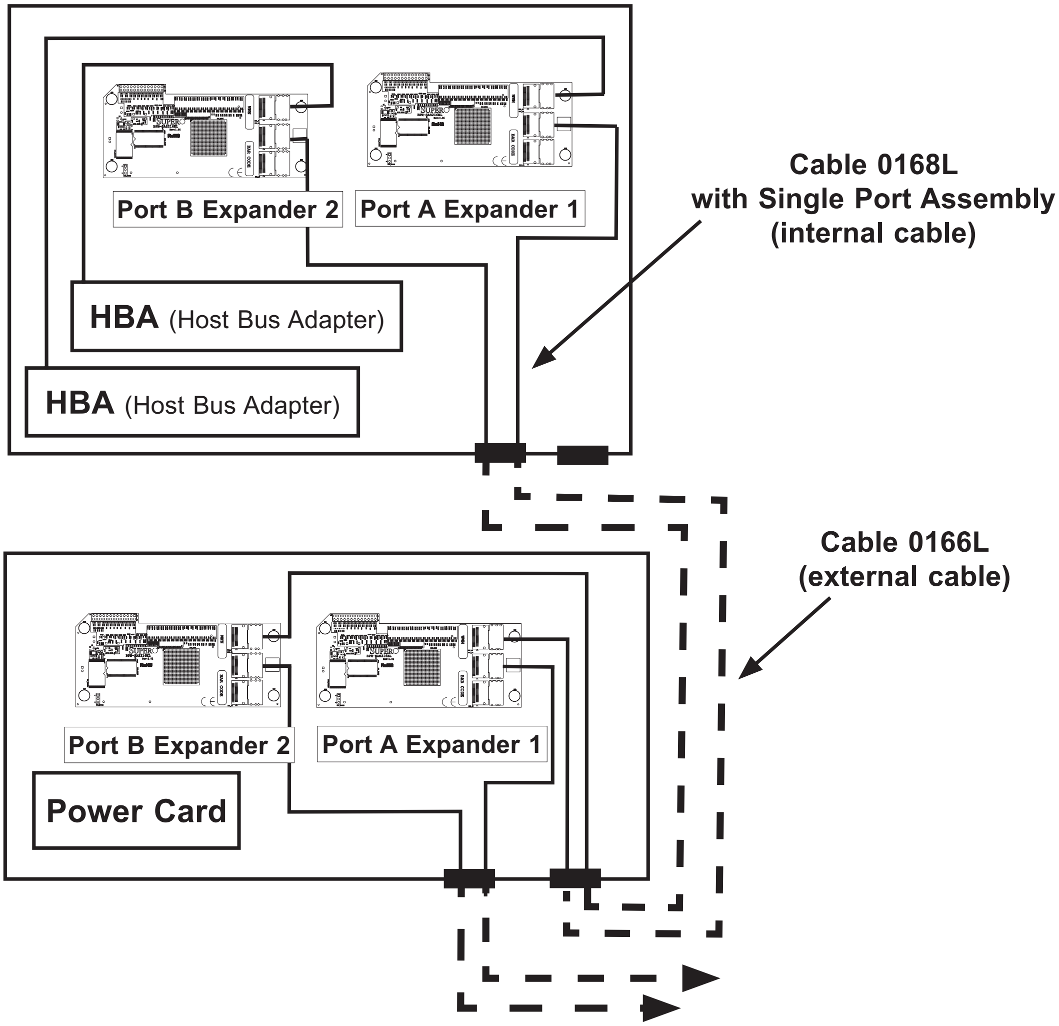

Port B Expander 2
Port A Expander 1
Cable 0168L
with Single Port Assembly
(internal cable)
HBA (Host Bus Adapter)
HBA (Host Bus Adapter)
Cable 0166L
(external cable)
Port B Expander 2
Port A Expander 1
Power Card

Figure D-20: Dual HBA Configuration

Dual HBA Configuration Cables

Dual Port Cable Assembly

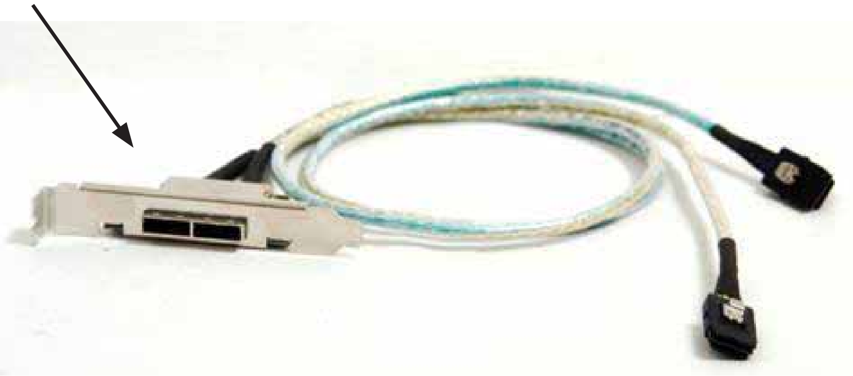


Figure D-21: Dual Port Internal Cable (CBL-0168L)

Cable Name: SAS Dual-port Cable Assembly, 68/76cm

Part #: CBL-0168L
Placement: Internal cable
Ports: Dual

Description: Internal cascading cable. Connects the backplane to the Host Bus Adapter (HBA) or external port. Used in dual port environments.

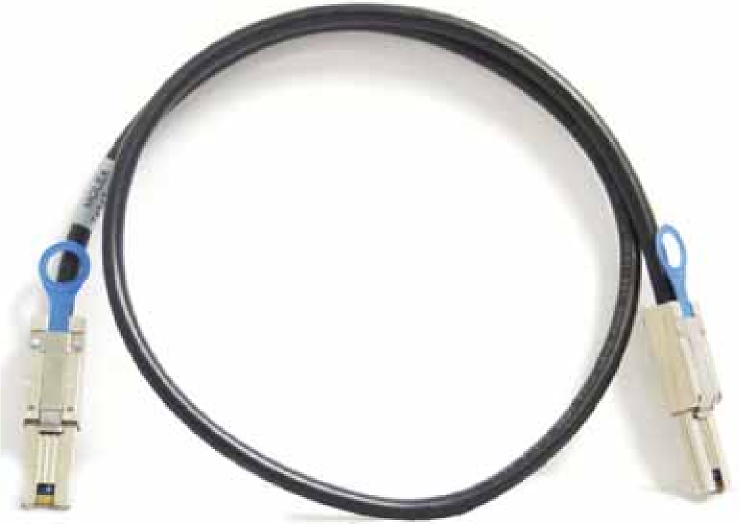


Figure D-22: External Cable (CBL-0166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68cm

Part #: CBL-0166L
Placement: External Cable
Ports: Single or Dual

Description: External cascading cable. Connects ports between servers. Use one cable for single port connections and two cables for dual port connections.

D-12 Supported Cascading Configurations

Cascading allows the system to access data at a faster rate by allowing several backplanes to share resources to reduce latency time.

The first backplane in a cascaded system requires a motherboard and HBA. Other servers require a power control card with no motherboard and no HBA. For more information, see the SC216 Chassis Manual available at www.supermicro.com.

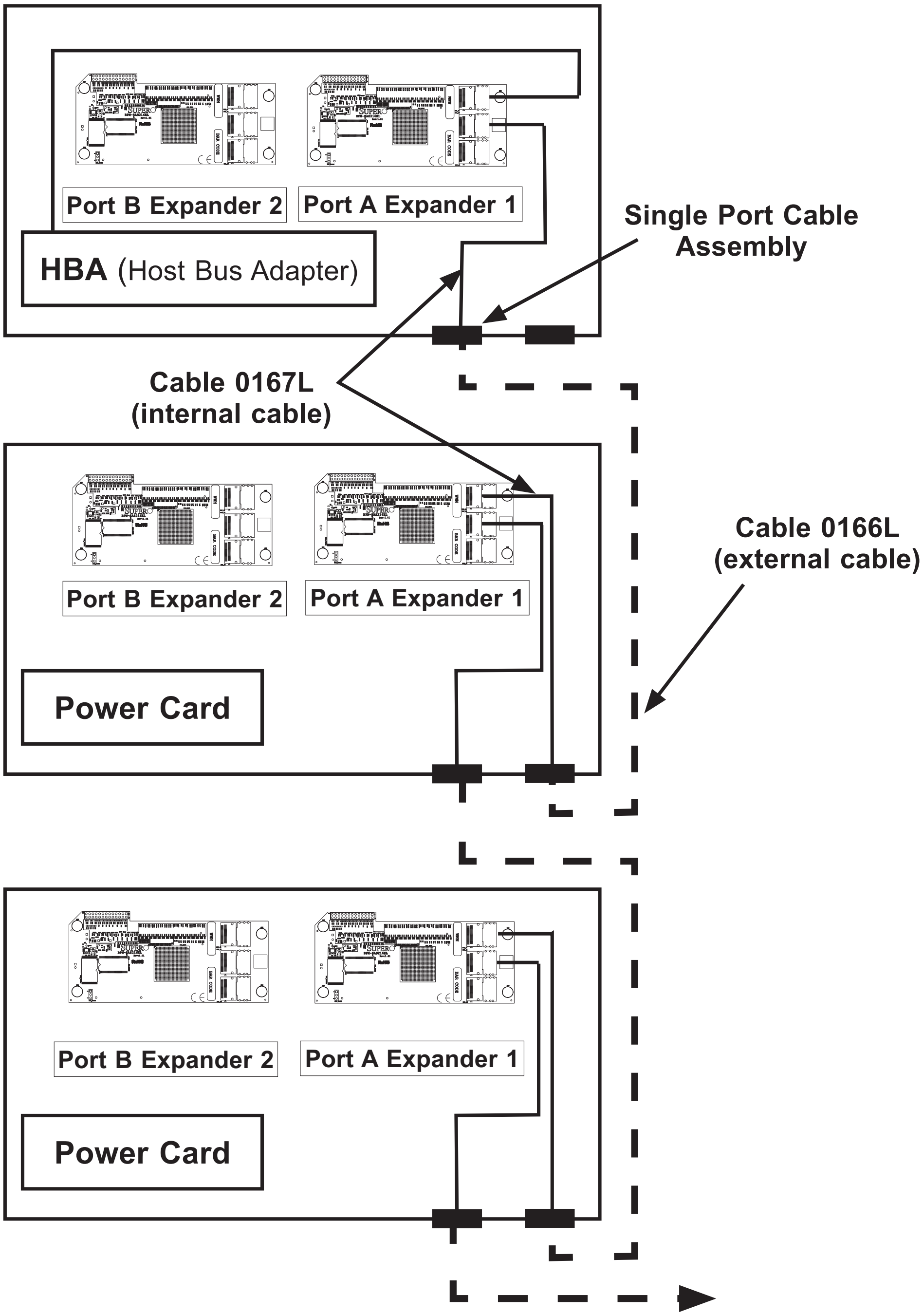

Port B Expander 2
Port A Expander 1
HBA (Host Bus Adapter)
Single Port Cable Assembly
Cable 0167L (internal cable)
Port B Expander 2
Port A Expander 1
Cable 0166L (external cable)
Power Card
Port B Expander 2
Port A Expander 1
Power Card

Figure D-23: Simple Cascaded Configuration

Server System with Single SAS HBA

The expanders allow horizontal branching. This configuration also applies to dual ports.

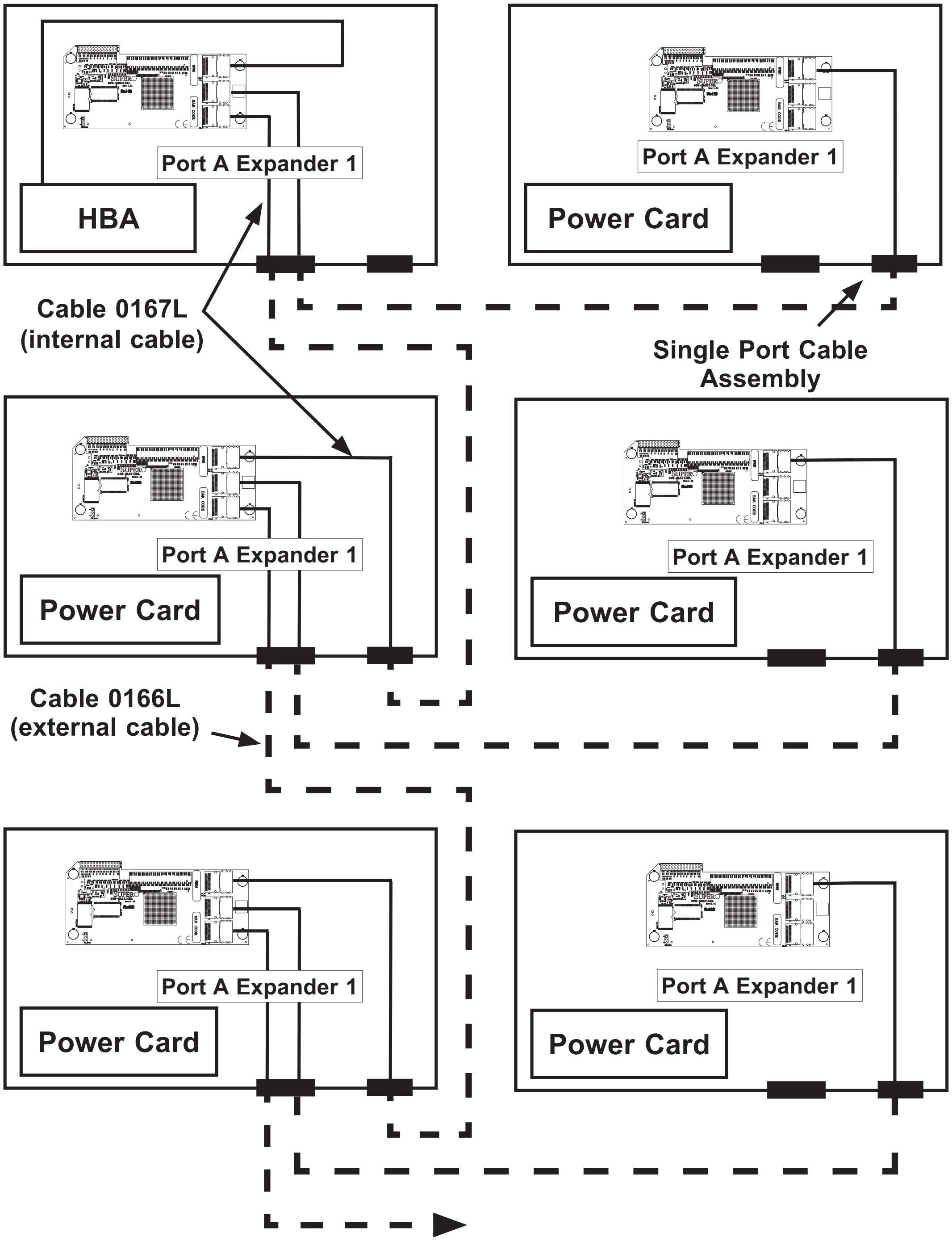

Port A Expander 1
HBA
Port A Expander 1
Power Card
Cable 0167L
(internal cable)
Single Port Cable
Assembly
Port A Expander 1
Power Card
Port A Expander 1
Power Card
Cable 0166L
(external cable)
Port A Expander 1
Power Card
Port A Expander 1
Power Card

Figure D-24: Cascaded Configuration with Horizontal Branching

Dual SAS HBA and Cascaded Configuration

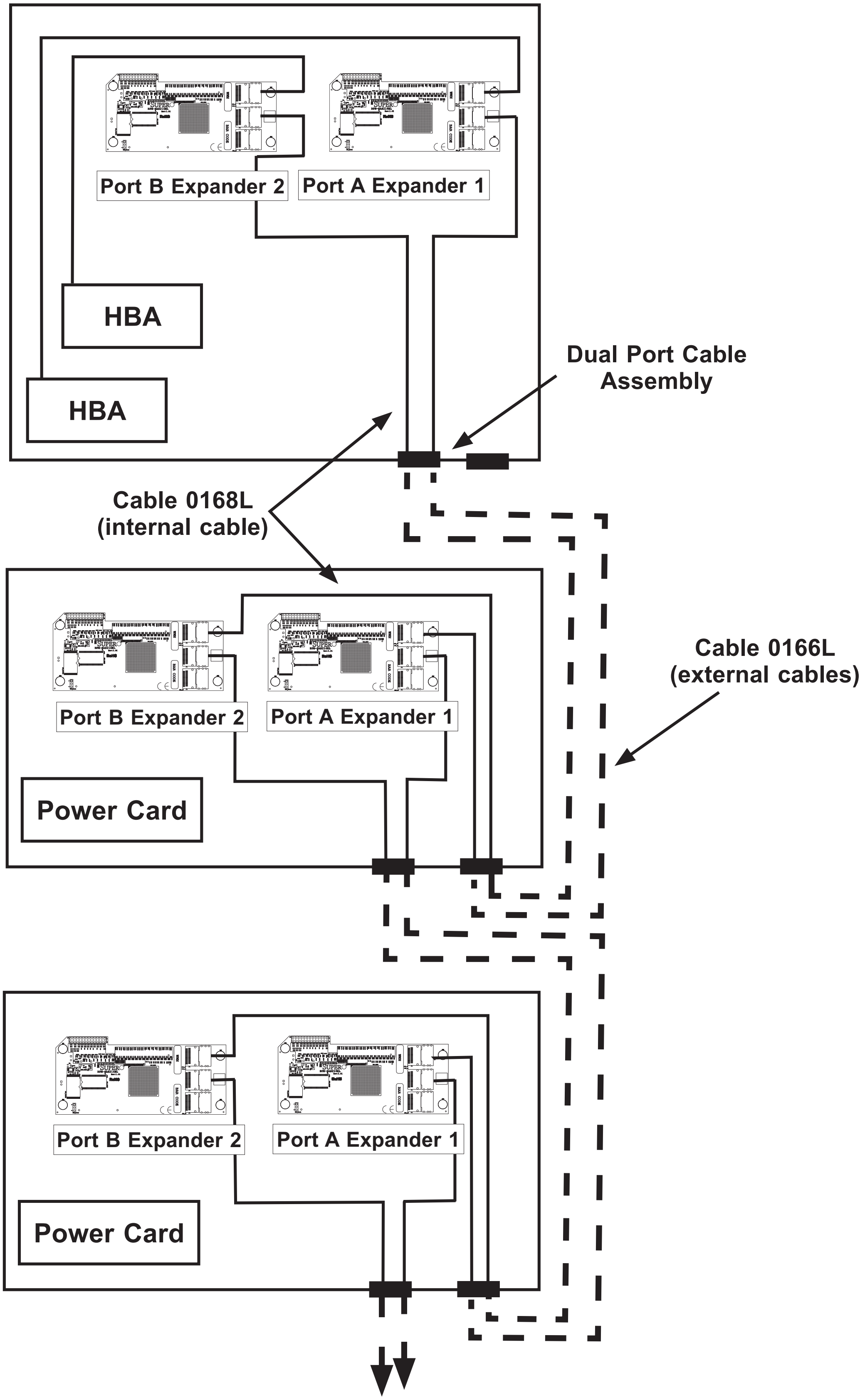

Port B Expander 2
Port A Expander 1
HBA
HBA
Dual Port Cable
Assembly
Cable 0168L
(internal cable)
Port B Expander 2
Port A Expander 1
Cable 0166L
(external cables)
Power Card
Port B Expander 2
Port A Expander 1
Power Card

Figure D-25: Dual SAS HBA with Cascaded Configuration

Dual SAS HBA and Cascaded Configuration with Branching

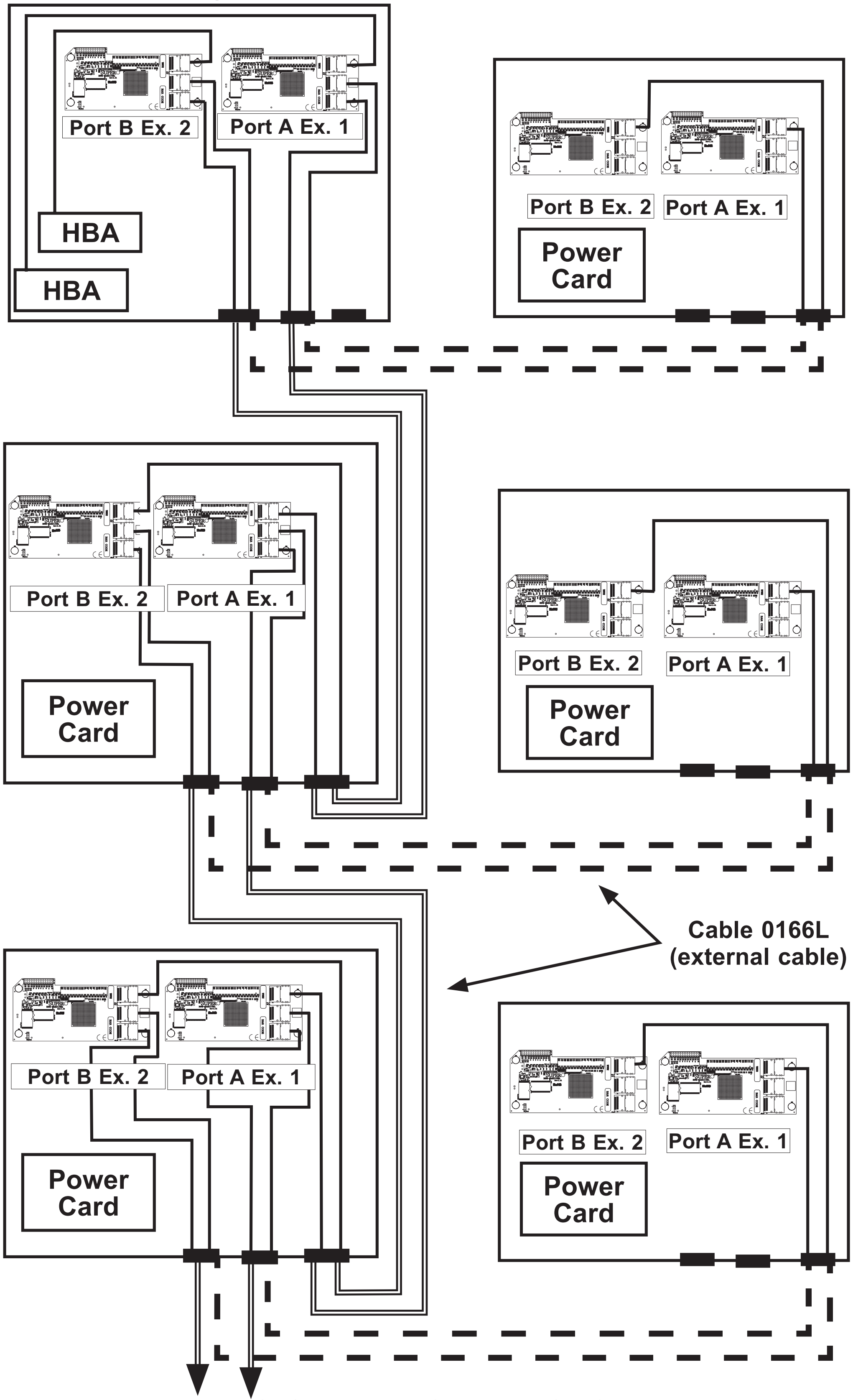

Port B Ex. 2
Port A Ex. 1
HBA
HBA
Port B Ex. 2
Port A Ex. 1
Power Card
Port B Ex. 2
Port A Ex. 1
Power Card
Port B Ex. 2
Port A Ex. 1
Power Card
Cable 0166L (external cable)
Port B Ex. 2
Port A Ex. 1
Power Card
Port B Ex. 2
Port A Ex. 1
Power Card

Figure D-26: Dual SAS HBA with Cascaded Configuration and Branching

Disclaimer (cont.)

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